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NO. 20

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♦ ♦ ♦

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THE INDUSTRIALIST.

VOL. 30.

MANHATTAN, KAN., MARCH 5, 1904.

No. 20

PERSIMMONS.

"PUCKERY as persimmons" has, in all probability, been accepted as a fitting simile ever since the fruit was discovered and named. In his "Evolution of Our Native Fruits" Prof. L. H. Bailey quotes that bold adventurer and hero of the primary histories, Captain John Smith, as recording, during the first few years of the settlement at Jamestown, that "Plumbs there be of three sorts. The red and white are like our hedge plumbs; but the other, which they call *Putchamins*, grow as high as a *Palmeta*; the fruit is like a medlar; it is first green, then yellow, and red when it is ripe; if it be not ripe it will drawe a man's mouth awrie with much torment; but when it is ripe it is as delicious as an apricock." Webster says the word "persimmon" is from Virginian Indian language, and "*Putchamins*" of the time of Pocahontas have no doubt developed into the persimmons of later date.

Even at this date it is altogether probable that more people know the persimmon from a hearsay knowledge of its ability to "drawe a man's mouth awrie" than from an intimate acquaintance when it is ripe and "delicious as an Apricock." The botanist was evidently aware of its excellence when he christened the genus *Diospyros*, meaning Jove's fruit.

The American species, *Diospyros Virginiana*, is noted by botanists as found from southern New England westward to Illinois and south, but in no section are the trees very abundant. It is quite a common tree in Missouri, and is occasionally found along streams in eastern Kansas. It is only in recent years that any effort has been made to cultivate the tree or to improve the fruit. It is quite probable that interest in our native persimmons was stimulated by the introduction of varieties of the Japanese species, *Diospyros Kaki*, and the statement made by I know not what authority, that the Japanese growers have developed their vari-



Persimmon Tree (four years old).

eties from a wild fruit, in no way superior to ours, to a beautiful fruit equaling a tomato in size and color and having few or no seeds.

The Japanese varieties are now grown to some extent in California and the Gulf states and are noted by Prof. R. L. Watts of the Experiment Station of Tennessee as being hardy in that state. The Horticultural Department of the Kansas Experiment Station has set a number of trees of different varieties of this species, but without exception they have been seriously injured by the cold weather, even when well protected by coverings of straw.

Greater size and fewer seeds are the points to be desired in improving the American persimmon. Many people who are acquainted with both species consider the native fruit superior to the Japanese in flavor and quality. Prof. J. B. McBryde, of the Agricultural Experiment Station of the University of Tennessee, in Bulletin Volume XI, Number 1, gives the average of analyses of persimmons made by him. A synopsis of his tables and his comparison of the composition of persimmons with some better known fruits contains the following:

Sugar in Pulp:		Total Acid:	
Japanese persimmons	16.54	Average of both persim-	
American persimmons.....	21.90	mon species	0.15
Cherries.....	11.32	Cherries	0.40
		Apples	0.56
		Strawberries	1.37
		Oranges	0.58
Sugar in Fruit:			
Japanese persimmons	16.51		
American persimmons.....	17.76		
Cherries.....	10.59		
Apples.....	9.79		
Strawberries	5.46		
Oranges	4.11		

The proximate average composition was:

Water:		Fats and Carbohydrates:	
Japanese persimmons.....	73.34	Japanese persimmons	25.20
American persimmons.....	60.42	American persimmons.....	37.88
Cherries.....	80.95	Cherries.....	17.46
Apples	82.35	Apples	16.73
Strawberries	90.52	Strawberries	7.87
Crude Protein:		Crude Ash:	
Japanese persimmons	0.73	Japanese persimmons	0.73
American persimmons.....	0.57	American persimmons.....	1.13
Cherries.....	1.09	Cherries.....	0.50
Apples	0.52	Apples	0.40
Strawberries	0.99	Strawberries	0.62

If it is true that people think more of the composition of their food than they formerly did, the analyses would seem to indicate that the persimmon is worth rather more as a food than some other

fruits, and deserves consideration on that ground; but it seems much more probable that the vast majority of people choose their fruits on account of personal preference and taste, and that the food value is not likely to be an important factor in encouraging the growth and improvement of the persimmon. The persimmon is growing in favor and in importance because it is good to eat. Most people who eat them like them, and the increasing sales of persimmons in the city markets and at the fruit stands indicate that there is a place in the market for this fruit. The fruit is usually eaten fresh, though there are recipes for its use in puddings, and it is sometimes preserved. The analy-

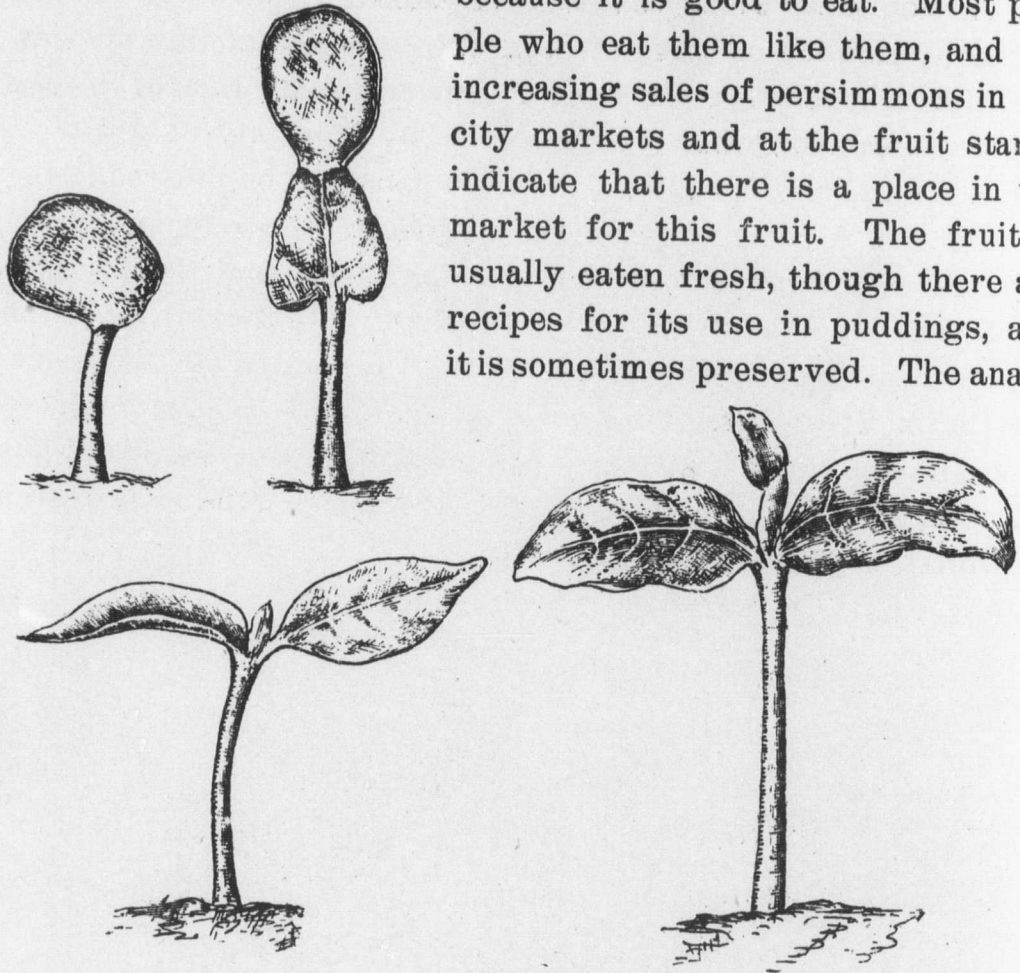
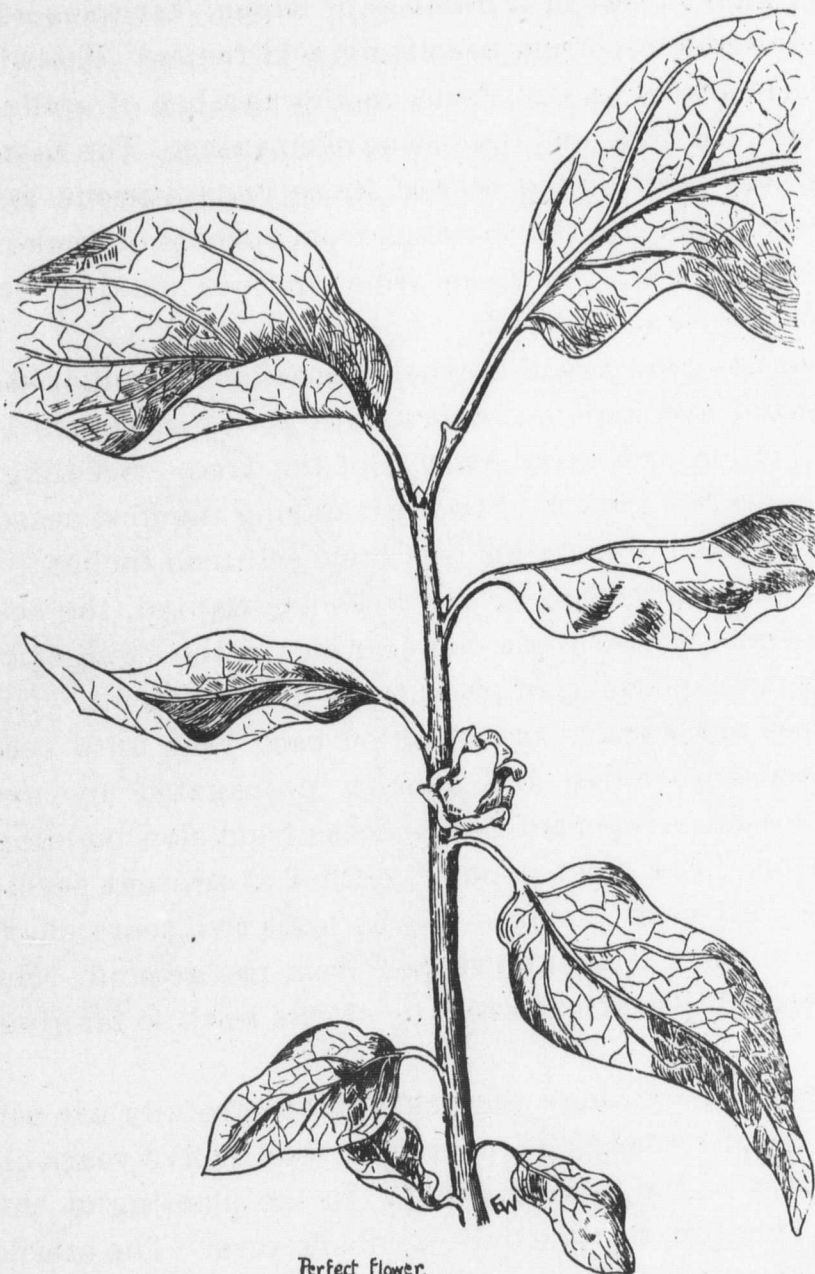


Fig. 1.

sis would seem to lend color to the stories told by former residents of southern plantations of exhilarating effects of "'simmon beer" in the good old times "befo' the wah."

The fruit keeps remarkably well, even when it is fully ripe before picking, and may be shipped almost any distance if packed in small boxes. Nearly all the native persimmons are shipped in quart berry boxes, packed in the twenty-four-box crate. The Japanese varieties are usually shipped in five-pound baskets or in the popular six-basket carrier used for peaches and tomatoes. Nearly all the native persimmons on the western markets come from Missouri, Arkansas, and the eastern counties of Kansas.

The price varies according to quality and demand, of course, but the greater part of the persimmons sold bring at least ten cents per box retail, and about a dollar and a half per crate wholesale. Extra quality fruit nearly always brings a good price.



Perfect flower.

Fig. 2.

There are but few trees of native persimmons under cultivation, but many nurseries now offer young trees for sale and a considerable number are being planted, usually in a small way for home use. Bulletin Number 60, of the Agricultural Experiment Station of Purdue University (Indiana), gives a very full discussion of the native persimmon, describing varieties and suggesting methods

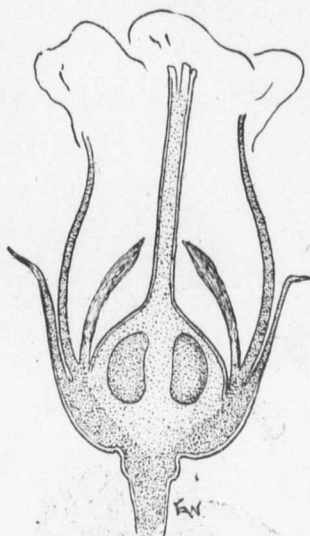
of propagation. Bulletin Volume XI, Number 1, of the Tennessee Experiment Station previously referred to, gives descriptions of a number of Japanese varieties.

The Horticultural Department of the Kansas Experiment Station has planted trees of a number of named varieties of native persimmons and seed from promising wild fruits. The wild fruit varies considerably in size, form, in the number of seeds, in the color of skin and flesh, and the season of ripening. The named varieties are selections of the best of these from various localities. Attempts to propagate the varieties from sprouts or suckers have not succeeded well, the trees from sprouts making but poor growth and being short-lived.

The seed has grown readily when planted in the fall or stratified in moist sand and kept out doors until spring. Figure 1 shows the germination and early growth of the tree. Seedlings have sometimes made a growth of two feet during the first season; the average has been something less than eighteen inches. Unless the seeds are planted where the trees are wanted, the seedlings should be transplanted when one year old, as the straight tap-root makes the transplanting of older trees quite difficult. Nursery-grown trees are usually transplanted each year until ready for sale. Named varieties are usually propagated by grafting, though some have reported fair success from cion budding early in the season. The most popular method at present seems to be that of the cleft-graft, using a tree at least two years old for the stock and working it about two feet from the ground. Summer budding and whip-grafting seedling stocks have so far given poor results.

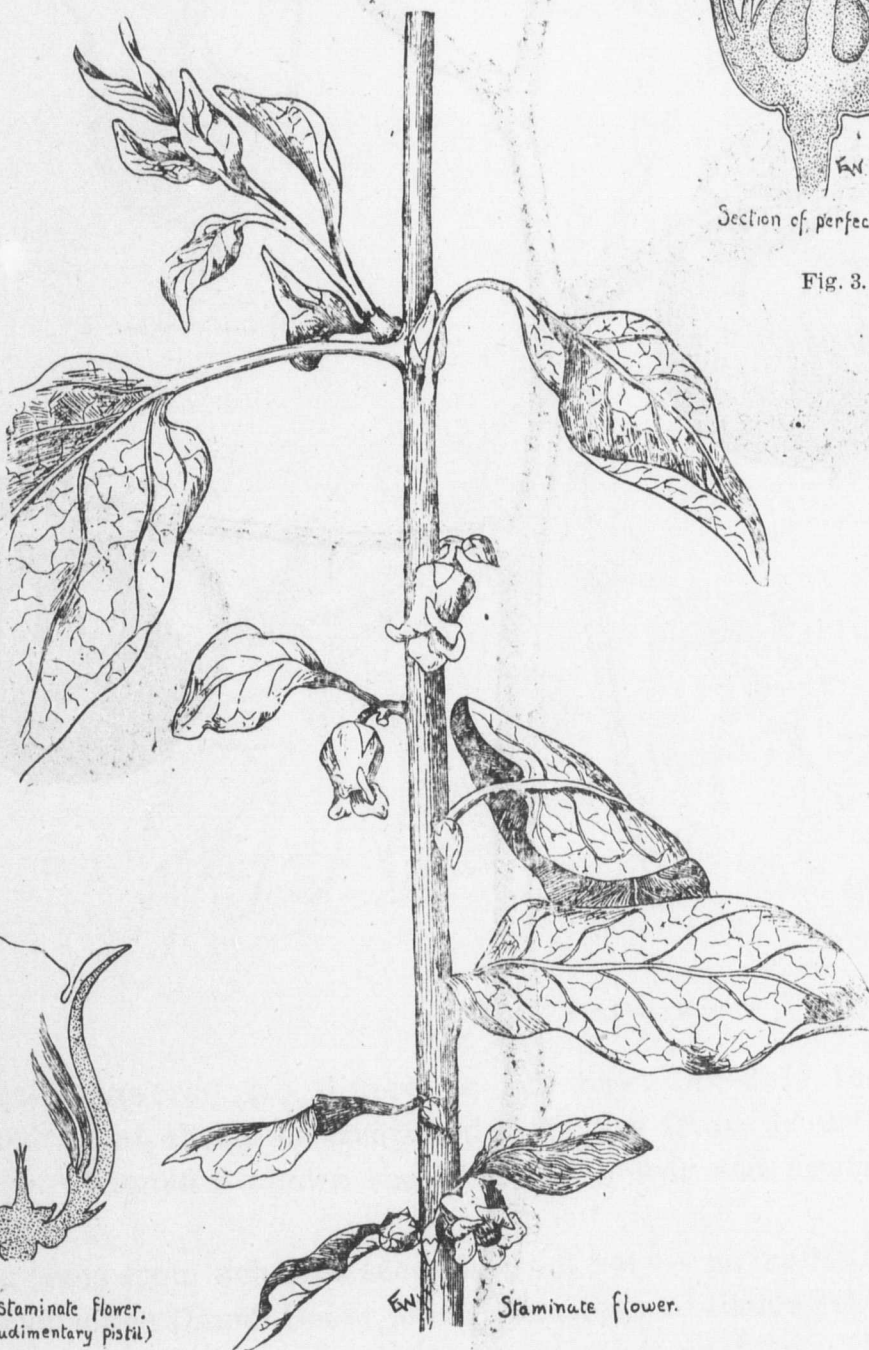
When testing seedlings they should be carefully examined as they become of fruiting age, usually at four or five years old, and the character of the flowers noted. In the planting at this Station some trees have borne only sterile flowers. The sterile flowers are quite similar in appearance to the perfect ones, being about the same size and color, but have a greater number of stamens than the perfect ones. The idea that the sterile-flowered trees are necessary for the successful pollination of the others seems to be erroneous, for trees growing miles from a sterile-flowered one are known to have borne good crops of fruit regularly. Blossoms of the perfect-flowered trees have borne fruit when covered to insure self-pollination. The flowers are borne

upon new growth wood, are quite inconspicuous, greenish yellow in color, and to some extent hidden by the leaves. The sepals and petals are in fours, the stamens of the perfect flowers usually eight in number, the sterile ones usually sixteen. Figure 2 shows a perfect flower; figure 3 a section of the same flower. Figure 4 shows a sterile flower, and a section of the same flower is shown in figure 5. It will be noted that the ovary is very



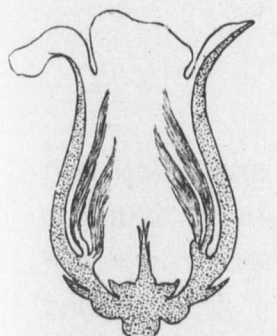
Section of perfect flower.

Fig. 3.



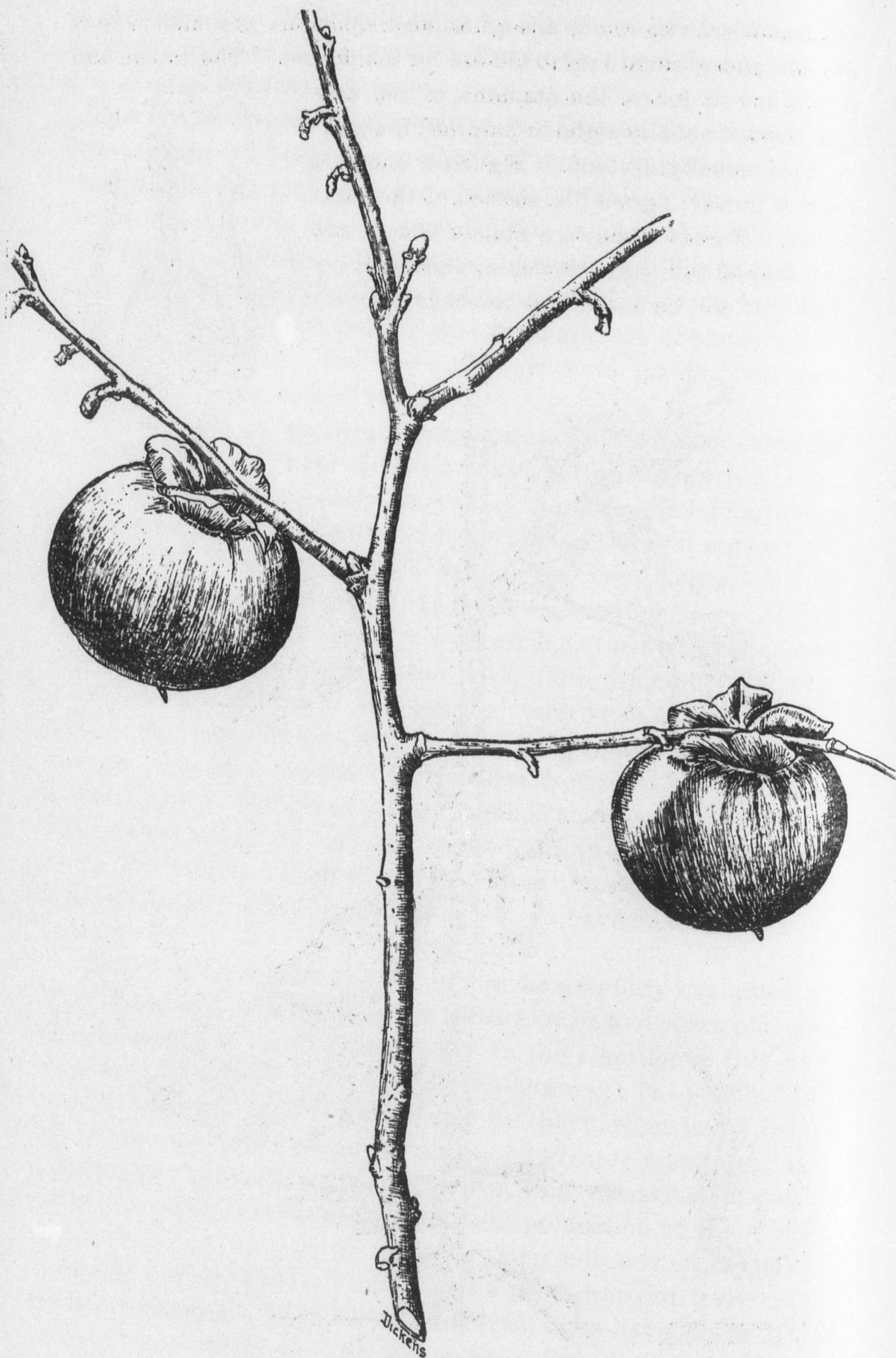
Staminate flower.

Fig. 4.



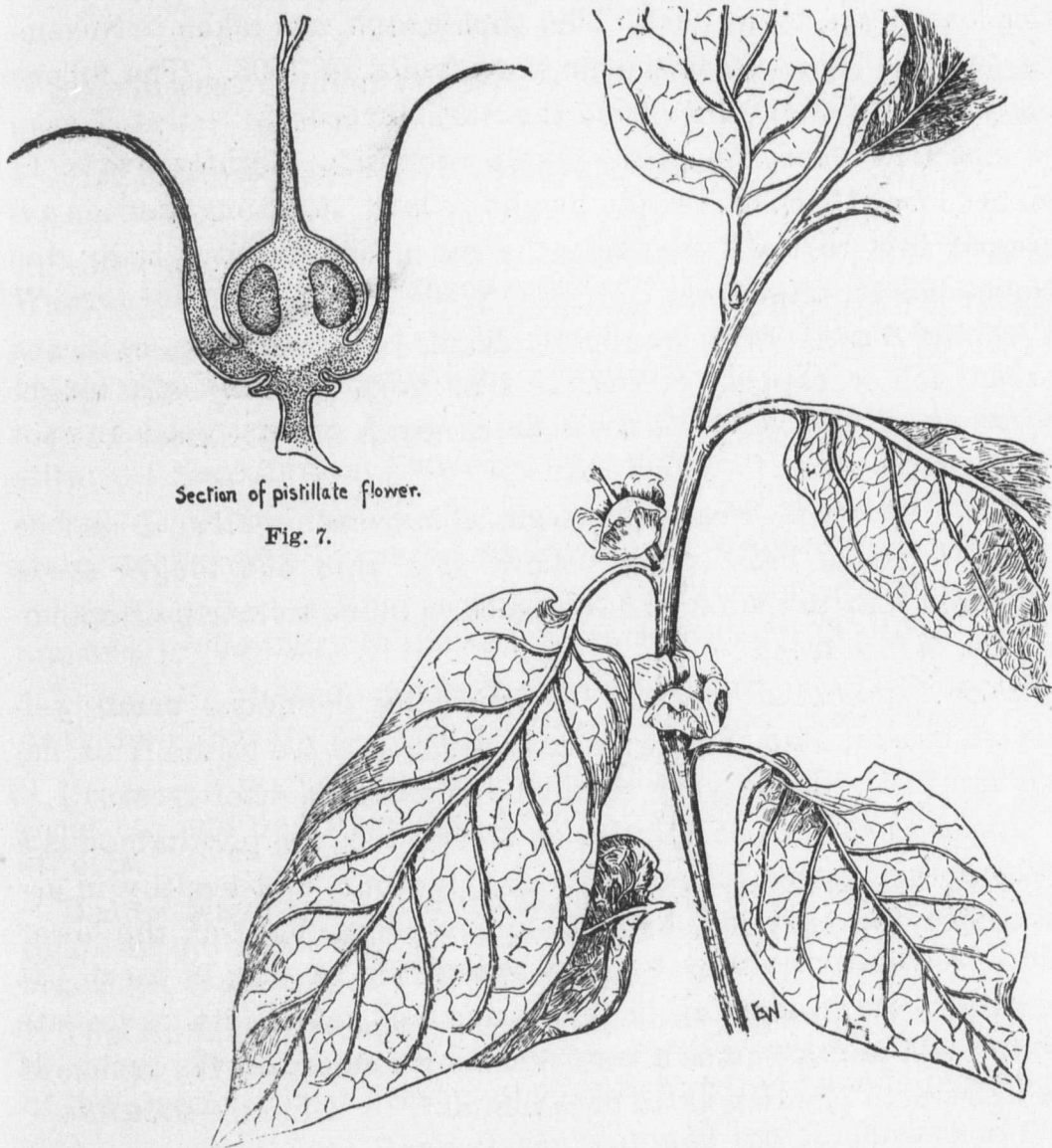
Section of Staminate flower,
(Showing rudimentary pistil.)

Fig. 5.



prominent in the perfect flower, while in the sterile ones it is hardly noticeable. The figures of flowers are natural size, the section three times the natural size. The sterile-flowered trees may be top-grafted with cions from bearing trees.

Trees bearing perfect flowers have frequently borne imperfect



Section of pistillate flower.

Fig. 7.

Fig. 6. Pistillate Flower.

pistillate flowers. No difference has been noted in the fruit ripened from these as compared with the fruits from perfect flowers. Figure 6 shows the pistillate flower and figure 7 the section of it.

The trees from selected seed have not yet borne fruit, but trees of the varieties Daniel Boone, Early Bearing, and Hicks, set in 1900, being then two years from the graft, bore a few fruits in 1902 and

1903. Shoto and Golden Gem have not yet come into bearing. Seedling trees of a variety of wild fruit, called American Honey by introducer, Mr. T. V. Munson, of Denison, Tex., have made good its growths and seem hardy and vigorous. About two-thirds of these seedling trees set in 1900 have borne fruit, the others being sterile-flowered. The half-tone on page 308 shows one of the best of this lot of trees set in 1900. The photograph was taken in November, 1903. This tree bore over sixty fruits in 1903. The following notes of varieties are from the Station records:

American Honey Seedling.—Fruit roundish, slightly ovate, $1\frac{3}{4}$ inches long, $1\frac{1}{2}$ inches broad; bright yellow; skin tough; seeds averaged five to the fruit; flavor very good, quality rich; ripe November 10, after frost.

Daniel Boone.—Fruit roundish oblate, $1\frac{1}{2}$ inches long, $1\frac{3}{4}$ inches broad; yellow, coppery red on the side next the sun; skin tough; seeds averaged five to the fruit; flavor good, quality good but not rich; ripe October 15, after frost.

Early Bearing.—Fruit roundish, somewhat ovate, $1\frac{3}{4}$ inches long, $1\frac{1}{2}$ inches broad, dull yellow; skin thin but tough; seeds averaged four to the fruit; flavor good, quality rich; ripe September 20, before frost.

Hicks.—Roundish oblate, $1\frac{1}{2}$ inches long $1\frac{3}{4}$ inches broad; yellowish-brown; skin shining; seeds averaged three to the fruit; flavor excellent, quality very rich; ripe October 10, after frost.

Aside from its possibilities as a fruit-tree the persimmon is a fine-appearing tree, usually strong, vigorous, and healthy in appearance; the leaves are bright, shining green, light on the lower side, frequently quite pubescent, noticeably regular in form. It is rather late in starting in the spring but retains its leaves late in the fall, and assumes a very fine brown as the leaves turn. It is well worth planting as an ornamental.

ALBERT DICKENS.

WATERWORKS CONTRACTORS.

Sealed bids will be received at the office of the undersigned till 12 noon, Monday, March 21, 1904, for the construction of a water plant for the Kansas State Agricultural College, in accordance with plans and specifications now on file at my office. Bids must be made out on blanks found with the specifications. Mark envelopes containing bids, "Bids for Waterworks." The right to reject any or all bids is reserved. E. R. NICHOLS, Pres., Manhattan, Kan.

THE INDUSTRIALIST.

BOARD OF REGENTS.

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Manhattan, Kansas.

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LOCAL NOTES.

Second-year student Popenoe is sick with measles, at his home near Topeka.

Miss Melton enjoyed (?) a two-days' vacation on account of having German measles.

Professor Ten Eyck attended a farmers' institute at Paxico, Wabaunsee county, on February 27.

Assistant Eastman, of the Horticultural Department, has had a tussle with a severe case of the mumps.

Professor Erf and Assistant Shoemith attended a farmers' institute at Norcatur, on February 26 and 27.

The drawings and specifications of the pump-house of the new waterworks were prepared by Prof. J. D. Walters.

The College battalion is enjoying exercises in distance judging, as a preliminary to the annual work in sharp-shooting.

Professor Roberts favored the Short-course Agricultural Society, on February 27, with a lecture on "Wheat Breeding."

Professor Walters has commenced the erection of an eight-room cottage on Bluemont Avenue, between Third and Fourth streets.

Doctor Mayo was called to Chase county last Tuesday to investigate an outbreak of disease among cattle, which he found to be ergotism, caused by eating wild rye hay containing ergot.

The Animal Husbandry Department is making cheese every Monday. Butter is being made three times a week. The output of the creamery is at present about five hundred pounds per week.

Contractor Henry Bennett has resumed the stone work of the Auditorium with a strong force of masons and expects to be ready for the roof trusses in less than six weeks, the ground-hog notwithstanding.

The farm crop report has been placed in the hands of the printer. It will be an extensive bulletin covering from forty to fifty pages, containing a discussion of experiments and their results, with fifteen full-page tables, giving results in condensed form, and ten illustrations of field crops. The report is very valuable and should be in the hands of every farmer in Kansas. It may be had free by simply addressing the director of the Experiment Station.
—Herald.

Student assistant S. S. Lard left for Fort Worth, Tex., March 4, to work for the Nissley Creamery Company as butter maker. Mr. Lard is a strong man and will hold his job all right.

Next Monday, or Monday of next week, the Animal Husbandry Department will take the short-course students and the sophomores of the agricultural course to Topeka to visit the Continental creamery, the Wolfe packing-house, and a number of other places of interest. Professor Erf and Assistant Kinzer will chaperone the party.

Asst. Caroline Hopps was agreeably surprised last week by a visit from her father and mother, who were returning from a trip through California. They left for their home in Lamoille, Ill., on Thursday. This was their first visit at this College and they were much pleased with the practical character of the instruction, especially with that of the Domestic Science Department.

REDUCED RATES TO CALIFORNIA, MARCH 1 TO APRIL 30.—That long-looked for California opportunity is here at last. March 1 to April 30, the Rock Island System will sell "tourist" tickets to principal points in California at these low rates: \$25 from Missouri River Points; \$25 from Manhattan, Kan. Tickets are good in tourists sleepers, which the Rock Island runs daily, Chicago and Kansas City to Los Angeles and San Francisco by way of El Paso; three times a week via Colorado Springs and Salt Lake City. March and April are the pleasantest months of the California year—doubly so because, at home, they are usually the very opposite. Tickets and births at all Rock Island ticket offices, or by addressing A. E. Cooper, D. P. A., Topeka, or J. A. Stewart, G. A. P. D., Kansas City. 17-27.

The Webster Literary Society presented their annual in form of a play Monday evening in the Manhattan opera-house to an unusually large audience. "The Union Scout" was probably the most clever and well-rendered production this society has ever given. Much credit is due Miss Katherine Winters for her assistance to the Websters in taking the part of the heroine, Miss May Meriton. The play was repeated Wednesday evening for the benefit of the Athletic Association, producing a net profit of between \$50 and \$60. The specialties were: A song by the Webster trio, Messrs. W. O. Gray, W. B. Neal, and E. J. Evans; a euphonium solo by Bruce R. Jackson, and a vocal solo by Miss Edith Huntress. The cast was as follows: May Meriton, Miss K. Winters; Tom Markman, T. L. Pittman; General Grant, E. J. Evans; General Wool, W. B. Banning; Lieutenant Ames, Earl Wheeler; Corporal Schneider, W. B. Neal; telegraph operator, W. White; Chas. Meriton, E. T. Pattee; Ned Pelton, T. E. Dial; Gen. Robt. E. Lee, A. M. Nash; Colonel Thorne, W. Turnbull; Old Pete, J. B. Thompson; Mr. Meriton, W. O. Gray; Mr. Pelton, W. B. Banning; Dan, J. Nygard; Sergeant Bly, J. G. Worswick; Corporal Max, W. H. Harold. The training was under the supervision of Professor Kammeyer.

The Farm Department has its crop report for 1903 in the printing-office and hopes to be able to mail the pamphlet in a few days. It will contain about seventy pages of printed matter, ten half-tone plates, and twenty full-page tables.

Professor Willard and Miss Rose, while in attendance at the Arkansas City Institute last week, were treated to a trip to the Chillico Indian School, across the line in Oklahoma. They are indebted to Mr. and Mrs. Walton for this extra courtesy, and enjoyed their visit to this great farm school very much. This school has been given the honorable task of preparing the exhibits for the Louisiana Purchase Exposition illustrating the work of the Indian schools, and its students are turning out some very fine work. L. E. Potter, '00, is dairyman, and Mr. Peairs, formerly a dairy course student here, is in charge of the farm.

In this number of the INDUSTRIALIST there is an advertisement for bids for the construction of a waterworks plant for this College. The bids will be opened on Monday, March 21. The specifications require the sinking of a six-foot well near the main entrance to the College grounds, the erection of a stone pump-house, the provision of an electric motor and a pump having a capacity of eight thousand gallons per hour against a head of two hundred fifty feet, the erection of a ninety-eight foot steel tower, with a steel tank holding ninety-five hundred gallons, several additional pipe lines and fire plugs, etc. The work is to be completed and in good running order by July 1, 1904. This plant will make the College independent of the city water-supply, give better fire protection and save annually quite a sum of money to the institution. The water bill for the past years has amounted to about \$1500 annually. The pump motor will be supplied with power from the central power station and its work will cost the College but little beyond the freight expenses of the fuel and necessary repairs.

ALUMNI AND FORMER STUDENTS.

R. M. Philbrook, '97, is teaching in Walla Walla, Wash.

Glick Fockele, '02, looked very natural playing his old part in the orchestra last week. He visited several days. He is now business manager for the *Le Roy Reporter*.

L. A. Fitz, '02, made a flying visit while on the way from Washington to his spring operations at McPherson, where he is in charge of the coöperative experiments in cereal testing and breeding, conducted by the Department of Agriculture and the Experiment Station.

J. G. Haney, '99, Superintendent of the Fort Hays Branch Experiment Station, was down on the twenty-ninth to discuss the spring experiments with the Station Council. He reports matters in good condition there yet, but rain will be a necessity soon unless serious damage to wheat is to be suffered.

Agnes Hopper, daughter of Geo. E. Hopper, '85, and freshman student in 1902, is now teacher of music in the Chillicothe Indian School.

Eva Philbrook, '97, sends her best wishes for the success of the College, from Oxnard, Cal., where she is a teacher in the Ocean View School.

Owing to absence on an institute trip the editor missed the call of H. M. Thomas, '98, who is now collector for the J. I. Case Threshing Machine Company, with headquarters at Wichita. We are glad to learn that Mr. Thomas' services are appreciated by his employers.

F. E. Hodgson, '03, spent a couple of days here refreshing his memory of things and bringing his knowledge of the College up-to-date, at the same time contributing to the pleasure of his old friends. He was specially interested in acquiring some knowledge of chemistry that will help him in the pure cider vinegar business.

At the Arkansas City farmers' institute last week, C. M. Baird, a former short-course student, was secretary of the meetings. L. E. Potter, '00, C. C. Wiley, student in 1888, and Mary Scott, freshman last year, were also met there. Miss Scott expects to return to College next year. Mr. Potter is dairyman at the Chillicothe Indian School, just across the line from Arkansas City, where he has the care of about three hundred cows, and some other duties in addition.

NOTICE.—Miss Lorena E. Clemons, '94, Secretary of the College, wishes accurate information concerning the whereabouts and occupation of all graduates, for use in the forthcoming catalogue. All alumni are requested to correct the data concerning themselves, and information from anyone concerning graduates will be gladly received. In the following instances the last catalogue could not state the residences of D. S. Leach, Wm. Ulrich, Ida Cranford-Sloan, J. A. Sloan, E. V. Cripps, R. S. Reed, G. L. Melton, and C. P. King.

From the *Herald* we learn that: Fred Dial, '97, is now studying ornithology and taxidermy at the University of Kansas. . . . F. W. Bobbitt, '00, is now superintendent of the waterworks and light system of Perry, Okla. . . . Lieut. Mark Wheeler has just returned from the Philippines, and is now stationed at Columbus Barracks, Ohio, with the Twenty-seventh Infantry, to which he was recently transferred from the Fourth Infantry. . . . H. R. Thatcher, '03, has left his position at Greencastle, Ind., and is now in charge of a large farm at Houston, Tex. . . . Carrie Wagner, '01, at present is seamstress in the Zuni Indian School, at Zuni, N. M. She is in charge of the sewing for over a hundred pupils, and incidentally teaches the girls of the school some of the rudiments of needlework.

Historical Society

VOL. 30

NO. 21

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ISSUED WEEKLY BY

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AGRICULTURAL COLLEGE

♦ ♦ ♦

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Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

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MANHATTAN, KAN., MARCH 12, 1904.

No. 21

THE CROWN GALL IN KANSAS.*

FOR the last seven years, while acting as inspector of nurseries in Kansas, my attention has been attracted to the crown gall by its frequency in nurseries on apple trees. With possibly one or two uncertain exceptions, I have found it more or less common everywhere, according to the year, and so far as I have been able to note, without much respect to varieties.

Some nurserymen believe certain varieties to be more subject to this disease than others, but I find no uniformity of opinion in this respect. Some regard it as the accompaniment of the stock used in grafting, and think that its wide distribution is due to the fact that the few prominent nurseries that grow most of the stocks sold in Kansas lie in a district well infected by this troublesome parasite. But this belief will not account for all the facts as to its presence or distribution, and I think it more likely that a thorough study of the pest will show it indigenous or long established in many fruit-growing localities in our state.

There is also a variation in opinion as to the gravity of the attack, some well-informed growers claiming to believe that the presence of the crown gall has little bearing upon the question of vigor, long life, growth and fruitfulness of the infected tree. Others again, who are both nurserymen and orchardists, insist that a tree once infected has at best a short life and never can become a profitable tree. This seems, from the pest laws, to be the general opinion in other states, and from the most that I can learn by reading and observation I think this the true and safe position in the case.

The most important study of the crown gall to date was made by Prof. J. W. Toumey, of the Arizona Agricultural Experiment Station, whose final conclusions were reported at length in his bulletin, No. 33 of the Arizona series, dated April, 1900. Subse-

*Read before the State Horticultural Society, December, 1903.

quent publications from various other states assume that the crown gall everywhere is the result of the attack of the same organism as that studied by Professor Toumey, though so far as I can learn this is mainly taken for granted, and possibly may yet be disproven. The organism discovered by Professor Toumey in crown gall in Arizona is a low type, belonging to the *Myxomycetes*, a group of debatable position, the reproductive body being a simple minute protoplasmic mass. Of this group the species are generally non-parasitic. As occurring in connection with crown gall, the *Myxomycete*, named by him *Dendrophagus globosus*, was found by Professor Toumey infesting "the hypertrophied tissue of the gall and consuming the living protoplasm contained therein." "The irritation caused by its presence stimulates growth and accelerates cell division, resulting in a mass of soft, abnormal tissue generally known under the name of crown gall." He believes the gall growth to be practically annual, leaving, by its death and decay during the winter, a wound on the stem of the infested plant around the margin of which new galls form the next year. These are more considerable in size, and the resulting wound is annually greater, the final effect being the rotting of the trunk and the breaking off of the tree at the wounded point.

The disease, as would be expected from the nature of its inception, is contagious, the organisms in their resting stages being transferable through the soil, or from place to place in infected trees. It was found to be readily transferred by inoculation, the carrying material being bits of sliced galls placed in incisions in the bark of healthy plants. It was also found that seedlings growing near infested orchard trees were often diseased early in their growth.

So far as my observation goes, seedling stocks do not commonly show the gall in appreciable size, unless by the presence of fascicled roots, but in grafts before planting, yearling and two-year apple-trees, I have found it in abundance, the galls being from the size of a pin-head to that of a walnut, or occasionally larger. I have little doubt that this organism is responsible to a degree unsuspected by nurserymen for the production of abnormally large growths called calluses, on grafts made early and stored in the cellar, and I suggest the experiment of selecting such and planting them separately to determine this point.

Another fact that I have determined to my own satisfaction, and which I have not seen stated in publications on this disease, is that the presence of the crown gall on a two-year-old nursery tree may often be known by the growth of several late branches low down on the trunk after the last pruning of the trees in the row. Such growths I have recognized almost to a certainty in Kansas nurseries, during my inspection in August, by their yellowish and tender appearance. The pulling of such a tree shows almost uniformly the presence of a well-developed gall below ground. At this time the root growth arising near the gall is inclined to be densely fascicled, and the main roots of earlier growth display peculiarly thickened tips, inordinately large, and these tips, with the portions of roots back of them for sometimes several inches, are of a soft and spongy texture through their whole diameter so that they may be pinched flat between thumb and finger.

Through my conversation with nurserymen I have come to the conclusion that this gall is often taken for the work of the apple-root louse, though after the true and characteristic differences are pointed out, the two are readily distinguished by a careful observer. In cases where large lateral roots on orchard trees of some age lie near the surface, they are attacked by the same gall, and in one such specimen, sent me by a generally critical observer as an aphid gall, the aphid was actually found on the gall to that degree that it was impossible to say what might have been the original affecting cause, yet the principal growth in the abnormal enlargement was undoubtedly of the crown-gall nature.

It has been the hope of some nurserymen to prevent the large percentage of loss from diseased stock by planting their apple grafts in locations and soil not before in apple-trees, but in some notable cases coming under my observation within the last few years this endeavor has failed signally of its object. In such a case it is for us to decide whether the disease was carried from the seedling bed or the grafting cellar, or whether it is in the soil. The former is my belief, though the proprietor of the nursery adhered to the latter.

A few years ago, while I was still in charge of the Horticultural Department in the Kansas Experiment Station, a prominent Kansas nurseryman proposed to me that I should plant on the grounds of the Experiment Station a lot of trees of the same variety, to be furnished by him, half of the trees showing the gall

and the others absolutely clean, so far as could be determined by examination. This was done, the trees being two-year-old Ben Davis, all, with the exception of the visible galls on half of them, being good average marketable trees of this variety. These trees were set in rich second-bottom, level, black land, on the Station grounds at Manhattan, and were spaced in planting so that they might grow for a number of years if necessary for the conclusion of the experiment. At this date my successor in the Horticultural Department, Professor Dickens, reports that there is practically no difference in the growth above ground of the trees of the two lots, and that of the trees originally clean of galls some are now affected. This trial is perhaps uncertain in one point, in that the ground planted has for some years past been used as a general nursery site, and it can not be shown how the clean trees now diseased were infested. What does certainly appear, however, is that trees undiseased to all appearance may contract the disease after planting in the orchard; and some uncertainty remains as to the responsibility of the nurseryman, even where he exercises unusual caution not to send out trees with the crown gall.

While presumably no bad result may follow in the use of cions from diseased trees, it seems bad practice to do as I have found was done in one nursery—that is to use, for planting orchard, trees thrown out as unsalable because infested with crown gall.

Attention should be called to the estimation in which crown gall is now held in several eastern states, large purchasers of Kansas-grown apple-trees, in their recent inspection laws. A few examples will serve to show that in many states this disease is, as I believe, properly held to be dangerous and transmissible within the meaning of an inspector's certificate:

In Illinois: "The contagious and destructive but comparatively little known disease now commonly called crown gall was reported in 1900 from fifty-two nurseries, more than twenty per cent of the whole, as affecting from one to one hundred per cent of certain blocks of apple stock. In all cases where the crown gall has been found in more than purely insignificant ratio the inspection certificate has been withheld until the owner of the nursery has agreed in writing to destroy all trees so diseased."

In Virginia: "Woolly aphis and crown gall are barred from commerce in this state, and all plants carrying these (among other stated pests) when found in transit or upon nursery yards, or de-

livered upon private premises, will be seized and destroyed, and the inspection tags (certifying freedom from noxious pests) issued to the shipper of such stock will be recalled."

In Alabama: "Crown gall (*Dendrophagus globosus*) when found in a nursery shall cause all diseased stock to be destroyed, otherwise stock may be shipped."

In Georgia: "Crown gall (*Dendrophagus globosus*) is hereby declared (among other pests named) to constitute infestation of trees and plants. Nursery plants found bearing crown gall shall be destroyed under the direction of the state entomologist, and a certificate issued to the owner only after he has given reasonable assurance that such infested plants have been or will be destroyed."

In South Carolina: Crown gall is declared "dangerously injurious, and the introduction is hereby forbidden in accordance with the law."

As to the identity of the galls on the various fruit plants and other woody plants upon which growths of this kind are found, it should be remembered that it is yet unestablished.

In Kansas, I have found these growths upon apple (especially and by far the most important), peach, plum, apricot, and raspberry. Observers in other states extend this list considerably. Professor Toumey's deductions are drawn from the study of the disease as appearing chiefly on the almond, though including in some of his trials the peach and apricot. It may not be important that the few apple seedlings in one of his tests gave negative results. I have never made the necessary histological studies of the several varieties of crown gall in our State to determine the nature of the parasite, but the general appearance and behavior of the galls, as well as their gross internal structure, shows them much alike in these regards.

In closing I may say that as I read the results of the experiments to check the growth of crown gall, they appear to be practically futile so far, and about all that can be done by the planter is to examine closely all trees before planting, and burn any found infected; by the nurserymen, to follow rigorously, and for his own final interest, the present practice of the conscientious grower, of burning all trees found on digging to be infested, and giving himself the benefit of the doubt that yet remains, to practice a strict rotation of susceptible trees with those not capable of infection.

E. A. POPENOE.

PROGRAM, SPRING TERM, 1904.

Freshman.				Sophomore.				Junior.				Senior.			
1	Rhetoric I.....	A 36	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39	1	Rhetoric I.....	A 36	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39	1	Rhetoric I.....	A 36	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39	1	Rhetoric I.....	A 36	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39
2	Sewing III.....	K 55	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39	2	Sewing III.....	K 55	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39	2	Sewing III.....	K 55	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39	2	Sewing III.....	K 55	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39
3	El. Physics.....	C 62	Rhetoric I..... A 36	3	El. Physics.....	C 62	Rhetoric I..... A 36	3	El. Physics.....	C 62	Rhetoric I..... A 36	3	El. Physics.....	C 62	Rhetoric I..... A 36
4	Geometry II.....	A 26	El. Physics..... C 62	4	Geometry II.....	A 26	El. Physics..... C 62	4	Geometry II.....	A 26	El. Physics..... C 62	4	Geometry II.....	A 26	El. Physics..... C 62
5	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39		Geometry II..... A 26	5	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39		Geometry II..... A 26	5	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39		Geometry II..... A 26	5	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39		Geometry II..... A 26
6	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39		Drill 4, or Calisthenics 2.....	6	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39		Drill 4, or Calisthenics 2.....	6	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39		Drill 4, or Calisthenics 2.....	6	{ Blacksmithing I..... S36 { Physics Lab. (2½)..... C39		Drill 4, or Calisthenics 2.....
7	Drill 4, or Calisthenics 2.....		DOMESTIC SCIENCE.	7	Drill 4, or Calisthenics 2.....		DOMESTIC SCIENCE.	7	Drill 4, or Calisthenics 2.....		DOMESTIC SCIENCE.	7	Drill 4, or Calisthenics 2.....		DOMESTIC SCIENCE.
AGRICULTURE.				AGRICULTURE.				AGRICULTURE.				AGRICULTURE.			
1	Anal. Chem. (10).....	C 54	Physiology..... F 60	1	Anal. Chem. (10).....	C 54	Physiology..... F 60	1	Anal. Chem. (10).....	C 54	Physiology..... F 60	1	Anal. Chem. (10).....	C 54	Physiology..... F 60
2	Anal. Chem. (10).....	C 54	Horticulture..... H 26	2	Anal. Chem. (10).....	C 54	Horticulture..... H 26	2	Anal. Chem. (10).....	C 54	Horticulture..... H 26	2	Anal. Chem. (10).....	C 54	Horticulture..... H 26
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4	Entomology.....	F 28	Calisthenics.....	4	Entomology.....	F 28	Calisthenics.....	4	Entomology.....	F 28	Calisthenics.....	4	Entomology.....	F 28	Calisthenics.....
5	Crop Production.....	G 52	Anal. Chem. (10)..... C 54	5	Crop Production.....	G 52	Anal. Chem. (10)..... C 54	5	Crop Production.....	G 52	Anal. Chem. (10)..... C 54	5	Crop Production.....	G 52	Anal. Chem. (10)..... C 54
6	{ Grain Judging (2½)..... G 56 { Ent. Lab. (2½)..... F 65		Anal. Chem. (10)..... C 54	6	{ Grain Judging (2½)..... G 56 { Ent. Lab. (2½)..... F 65		Anal. Chem. (10)..... C 54	6	{ Grain Judging (2½)..... G 56 { Ent. Lab. (2½)..... F 65		Anal. Chem. (10)..... C 54	6	{ Grain Judging (2½)..... G 56 { Ent. Lab. (2½)..... F 65		Anal. Chem. (10)..... C 54
7	Drill 4, or Calisthenics 2.....		Drill 4, or Calisthenics 2.....	7	Drill 4, or Calisthenics 2.....		Drill 4, or Calisthenics 2.....	7	Drill 4, or Calisthenics 2.....		Drill 4, or Calisthenics 2.....	7	Drill 4, or Calisthenics 2.....		Drill 4, or Calisthenics 2.....
VEGETABLE GARDENING.				VEGETABLE GARDENING.				VEGETABLE GARDENING.				VEGETABLE GARDENING.			
1	Veg. Gardening.....	H 26	Zoology..... F 28	1	Veg. Gardening.....	H 26	Zoology..... F 28	1	Veg. Gardening.....	H 26	Zoology..... F 28	1	Veg. Gardening.....	H 26	Zoology..... F 28
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3	Geology.....	F 28	Amer. Literature..... A 62	3	Geology.....	F 28	Amer. Literature..... A 62	3	Geology.....	F 28	Amer. Literature..... A 62	3	Geology.....	F 28	Amer. Literature..... A 62
4	Civics.....	F 36	Dom. Science III..... K 31	4	Civics.....	F 36	Dom. Science III..... K 31	4	Civics.....	F 36	Dom. Science III..... K 31	4	Civics.....	F 36	Dom. Science III..... K 31
5	{ Agr. Industrial..... F 36 { Surveying (2½)..... F 35		Dom. Science III..... K 31	5	{ Agr. Industrial..... F 36 { Surveying (2½)..... F 35		Dom. Science III..... K 31	5	{ Agr. Industrial..... F 36 { Surveying (2½)..... F 35		Dom. Science III..... K 31	5	{ Agr. Industrial..... F 36 { Surveying (2½)..... F 35		Dom. Science III..... K 31
6	Surveying (2½).....	F 35	Zool. Lab..... F 35	6	Surveying (2½).....	F 35	Zool. Lab..... F 35	6	Surveying (2½).....	F 35	Zool. Lab..... F 35	6	Surveying (2½).....	F 35	Zool. Lab..... F 35
ANIMAL BREEDING.				ANIMAL BREEDING.				ANIMAL BREEDING.				ANIMAL BREEDING.			
1	Animal Breeding.....	D 31	Eng. Literature II..... A 60	1	Animal Breeding.....	D 31	Eng. Literature II..... A 60	1	Animal Breeding.....	D 31	Eng. Literature II..... A 60	1	Animal Breeding.....	D 31	Eng. Literature II..... A 60
2	Plant Dis. & Breed.....	F 53	Psychology..... A 33	2	Plant Dis. & Breed.....	F 53	Psychology..... A 33	2	Plant Dis. & Breed.....	F 53	Psychology..... A 33	2	Plant Dis. & Breed.....	F 53	Psychology..... A 33
3	Forestry.....	H 26	Ther. Cookery (7)..... K 30	3	Forestry.....	H 26	Ther. Cookery (7)..... K 30	3	Forestry.....	H 26	Ther. Cookery (7)..... K 30	3	Forestry.....	H 26	Ther. Cookery (7)..... K 30
4	Eng. Literature.....	A 60	Amer. History..... F 36	4	Eng. Literature.....	A 60	Amer. History..... F 36	4	Eng. Literature.....	A 60	Amer. History..... F 36	4	Eng. Literature.....	A 60	Amer. History..... F 36
5	Plant Lab. (2½).....	F 65		5	Plant Lab. (2½).....	F 65		5	Plant Lab. (2½).....	F 65		5	Plant Lab. (2½).....	F 65	
6	Plant Lab. (2½).....	F 65		6	Plant Lab. (2½).....	F 65		6	Plant Lab. (2½).....	F 65		6	Plant Lab. (2½).....	F 65	

Freshman.

Sophomore.

Junior.

Senior.

Freshman.					
1	{ Foundry.....S38 { Obj. Drawing (2½).....A80 }	El. Botany.....F53	Readings.....W33	Algebra II.....F59
2	{ Foundry.....S38 { Geom. Drawing (2½).....A76 }	Classics.....A62	Algebra II.....A26
3	Algebra III.....C13	{ Foundry.....S38 { Geom. Draw. (2½).....A76 }	Sewing II.....K59	Readings.....A62
4	El. Botany.....F53	{ Foundry.....S38 { Geom. Draw (2½).....A76 }	Algebra III.....C13	Agriculture.....G52
5	Obj. Drawing (2½).....A80	Algebra III.....A63	El. Botany.....F53
6	Classics.....A32	Algebra II.....A26
7	Drill 4, or Calisthenics 2.....	Drill 4, or Calisthenics 2.....	Drill 4, or Calisthenics 2.....	Drill 4, or Calisthenics 2.....	Drill 4, or Calisthenics 2.....
Sophomore.					
1	{ Woodwork or.....S26 { Sewing I.....K59 }	Algebra I.....A71
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FRESHMAN.

PREPARATORY.

TEXTILES AMONG THE ANCIENTS.

AMONG savages or half-civilized people, garments, if such they could be called, were first made from the skins of animals, tanned and used as a blanket or covering. Later the skins were shaped and sewed together with leather thongs, a bone needle, something like an awl, helping in the process. As people advanced in civilization their clothing became better. The knowledge they gained aroused in them a desire for something better than the rough clothing of their ancestors, and helped them to find new ways of using the materials about them.

Spinning and weaving were practiced long before the Christian era, and were at first done entirely in the home. The Greeks had a tradition that the ancient people had been taught to spin by a goddess. Women of the highest position in life were proud to be able to do this work. The story is told of Queen Penelope, whose husband, Ulysses, had sailed away and after many years had not yet returned. The Queen was troubled with many suitors, and in order to gain time, she told them to wait until she finished weaving a piece of cloth upon which she was working. During the night she unraveled what she had woven in the daytime, thus keeping the piece unfinished until Ulysses returned.

Linen and wool are repeatedly spoken of in the Bible, and sheep raising is an important industry mentioned there. These two materials were the first woven cloths, the origin of linen being unknown. The robes worn by Hebrew priests in their religious and funeral ceremonies were made of linen. There are pieces in existence known to have been woven over four thousand years ago, in which mummies found in the Pyramids were wrapped. The Egyptians exported large quantities of it, and it was sometimes used as a ransom for prisoners.

Linen was woven in various ways, being combined with wool and with silk. In Damascus, which was well known for its manufacture of cloth, flowered patterns were introduced into woven material, and it is from this that Damask takes its name.

The process of making wool into cloth was at first very crude, and consisted of twisting and rubbing wool with clay and water, forming a sort of felt. A little later came weaving, dyeing, and using the thistle or teasle to raise the nap on the cloth. Elaborate patterns were woven into the cloth, much of which was worn by kings and queens. Beautiful tapestry work, some representing

historic scenes, others simply a flowered pattern, was also made. Much of this art was lost after the downfall of Rome, and the cloth made in the middle ages was coarser.

Greece, Italy and Spain produced some of the best woolen material. India was renowned for its beautiful shawls, and Constantinople for all kinds of cloth, especially for the beauty and variety of its woolen pieces. The fineness of manufacture varied greatly as the people differed in manual skill.

Fraud was practiced then as now. In England one man preached a sermon against "the stretching of woven pieces to more than proper length and the practice of then restoring the body of the cloth by incorporating into it a so-called 'flock powder,' apparently consisting of chopped wool." Chalk and ointments of different kinds were also rubbed into the wool.

Silk and cotton were not known so early as were linen and wool, though in Egypt, India and China they were woven before the Christian era. Four hundred fifty years before Christ cotton was written of as growing on trees. "There are trees of India bearing, as their fruit, fleeces more delicate and beautiful than those of sheep," the product of which was woven into cloth. The cotton cloths made by the Hindoos were equalled in fineness only by those made by the best machinery of the present time. Calico received its name from being first made in Calcutta. Some of this is described as being "so fine that you can hardly feel it in your hand, and the thread when spun is scarcely discernible." The manufacture of cotton cloth was practiced by the Mexicans before the discovery of this country. Cortez received as presents from Montezuma "curtains, coverlets and robes of cotton fine as silk, of rich and various dyes, interwoven with feather-work that rivaled the delicacy of painting."

China is one of the oldest silk-manufacturing countries. Chinese records show that about 2700 B. C., an emperor of that country commanded the empress to experiment in using the thread from the cocoon of the silk worm. She became much interested in the work, fed the worms herself, and discovered methods of reeling and weaving the silk. The Chinese say that for this she was made a goddess, being called the "goddess of silk worms." The process of making silk was kept secret for a long time after this, and Aristotle was the first European to learn its origin. The theory of the Greeks and Romans for many

years was, that there were "trees producing fleeces of downy wool which, after being sprinkled with water, is combed off in finest thread and woven into silk."

Gold was often interwoven with silk, and robes were finely embroidered. The cloth was valued at its weight in gold. Roman men and women both wore silken garments, but a law was passed restricting its use to women, and only to the wealthiest among these.

INA F. COWLES.

UNSOLVED AND UNSOLVABLE PROBLEMS IN MATHEMATICS.

IN THE course of progress in most branches of learning problems arise which, for long years and even centuries, baffle the efforts of the most skillful and persistent investigators, and finally yield their solutions, in the light of later developments in the general field in which they belong. The science of mathematics affords illustrations of this fact. Here, however, it is not always the actual solution which has been thus obtained, but sometimes the long process has been brought to an end by a proof of the insolubility of the problem in question. Instances of problems of the latter character are the trisection of the angle, the quadrature of the circle, and the duplication of the cube.

The part played in the development of a subject by the long-continued consideration of a few of its difficult problems is not fully appreciated. It is not always true that the particular questions involved are of special intrinsic importance. These "hard knots" in mathematics have yielded their most beneficent result in developing the branch of knowledge of which all together they formed a very small part. The attempts to solve the three geometrical problems above referred to led to the discovery, in Euclid's time, of many of the properties of conic sections and higher curves; and the squaring of the circle, which proved an elusive phantom for over two thousand years, had much to do with the splendid development of modern analysis. Had these problems been brought to an immediate solution, the progress of mathematics would have been retarded. Here, as elsewhere, failure in the smaller has oftentimes meant success in the larger, and we have another confirmation of the saying that the search for truth is to be preferred to its possession.

Some of the problems universally recognized by mathematicians as insoluble are, (1) the quadrature of the circle, (2) the

trisection of the angle, (3) the duplication of the cube, (4) the algebraic solution of the equation of degree higher than four, (5) the construction of regular polygons of n sides where n is a prime number, or the power of a prime, not expressible by the formula $2^k + 1$, k being any integer. The truth with regard to numbers four and five was found during the last century by Abel and Gauss, respectively.

For the purpose of this article we group under a separate head some other problems in mathematics whose solution has been sought for a long time but not yet obtained, and in the case of which there is no reason for supposing that they are insoluble. Among such unsolved problems the following one, known as the astronomical "problem of three bodies," is widely familiar outside the narrow circle of mathematicians. Given by the astronomer, the masses and distances of three heavenly bodies moving subject to Newton's law of gravitation; required by the mathematician to find the exact path which each body describes. Thus far only approximate solutions have been obtained. The problem will perhaps yield to treatment after a further development of the subject of celestial mechanics.

Another problem, which has hitherto proved intractable, is that of the frequency of prime numbers. Expressed otherwise, it is proposed to determine how many prime numbers there are below a certain given number. The solution when found will doubtless be given by means of a formula after the manner of equations.

In this same realm of the theory of numbers occurs a very remarkable proposition, known as Fermat's Last Theorem. Fermat was a French mathematician of the seventeenth century who did much in the way of enlarging mathematics by means of new statements, leaving the rigorous proofs for later scholars. The theorem is to the effect that no integral values of x , y , z , can be found to satisfy the equation $x^n + y^n = z^n$ if n is an integer greater than 2. Fermat discovered proofs of the theorem for the cases $n=3$ and 4, and during the last century similar results were obtained for $n = 5, 7$, and 14. After the lapse of nearly three centuries the proposition still lacks a general demonstration. There is no reason, however, to doubt its truth, and the fact that every other assertion of Fermat in the subject of number theory has been subsequently verified points strongly to the belief that this stronghold will at last be taken.

The mathematician of to-day does not give so much attention to isolated problems of difficulty. He regards them as rather the legitimate objects of inquiry for an ingenious curiosity. The bearings and relations of unanswered questions are better understood now than formerly. Although doubtless true that their solution would be in the interest of progress, yet no large extension of the more general subject would probably take place. It is not difficult to see why less expansion would occur in a period of later than in one of earlier development. Nevertheless these mountain peaks of difficulty, which have loomed up large in the intellectual horizon, have fulfilled an important mission. By attracting the best efforts of many minds, they have at length permitted access to the wide expanse of richer fields beyond. B. L. REMICK.

REDUCED RATES TO CALIFORNIA, MARCH 1 TO APRIL 30.—That long-looked-for California opportunity is here at last. March 1 to April 30, the Rock Island System will sell "tourist" tickets to principal points in California at these low rates: \$25 from Missouri River Points: \$25 from Manhattan, Kan. Tickets are good in tourists sleepers, which the Rock Island runs daily, Chicago and Kansas City to Los Angeles and San Francisco by way of El Paso; three times a week via Colorado Springs and Salt Lake City. March and April are the pleasantest months of the California year—doubly so because, at home, they are usually the very opposite. Tickets and berths at all Rock Island ticket offices, or by addressing A. E. Cooper, D. P. A., Topeka, or J. A. Stewart, G. A. P. D., Kansas City. 17-27. •

The College frequently receives letters of inquiry on agricultural, scientific or educational subjects that are poorly written and horribly spelled. The climax was reached some years ago by a letter written in modern Greek, mixed with many Arabic terms. It was impossible to get it translated this side of St. Louis, where an attache of the Austrian consulate deciphered the document. Last week we received another letter that has so far defied every attempt at translation, though we have tried English, German, French, Spanish, Scandinavian, Italian, Volapuk, and a number of other civilized keys to unlock its meaning. We are willing to do our best, however, and keep on trying.

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LOCAL NOTES.

The mumps and measles have subsided.

The Experiment Station is mailing Doctor Mayo's bulletin on "Vaccination and Blackleg."

Miss Jennie A. Reynolds writes from Gallup, N. M., that she is teaching in the schools at that place and that she is getting along nicely.

Harold, the little three-year-old son of Professor and Mrs. McKeever, fell and fractured both bones of his lower left arm. As a result he is now wearing a splint.

The assignment committee will begin the work of making assignments for spring term next Wednesday or Thursday. Every student must get assigned before the close of the winter term.

The sixth number of the College Lecture Course came off last Tuesday night. It consisted of an illustrated lecture on "Wonders of Modern Science," by J. W. Clark. The subject was well handled by the speaker and highly appreciated by the students.

We are in receipt of the commencement program of the Kansas City Veterinary College, to be held March 15, and notice that three of the forty-six graduates are from the Kansas State Agricultural College, viz: Charles Eastman, '02, Fred E. Johnson, '99, and Albert T. Kinsley, '99.

The College Y. M. C. A. will give a banquet to their members and to invited guests, in the Women's Gymnasium, on Monday night, March 14. Chancellor Strong, of the State University, has promised to be present and give an address, and there will be toasts by a number of others.

J. W. Howard, of Jewell City, a printer of considerable experience, has recently been employed by the Printing Department on account of a rather continued rush of work. The increased demands made on the department have been such of late that it is impossible for the student force to meet them.

The new Dairy Hall is assuming a finished aspect. The roof and exterior wood-work have received their third coat of paint and the masons have commenced the outside pointing. The pointing and cleaning of the walls is being done by Fred Anderson, of Manhattan, who has pointed nearly every building "on the hill."

The winter term will close Friday, March 25. Spring term will open Tuesday, March 29. Examinations for admission will be held Monday, March 28, at 9 A.M.

The play "Nathan Hale" will be given by home talent March 17, at the Manhattan opera-house for the benefit of the City Library Association. Senior student R. D. Scott is the director and trainer.

The Manhattan Horticultural Society will meet in Horticultural Hall, Thursday, March 17, 3:00 P.M. The program will consist of a demonstration in propagation of house plants, by Wm. Baxter and his class in floriculture, and a paper on "Dark Forcing of the Pie-Plant," by A. J. Nicholson. There will also be a general report on crop prospects. Everybody is invited.

Dr. Mayo's new book is meeting with almost phenomenal success. The following from the *Breeders' Gazette* is only one of a long series of similar items that have appeared lately: "The Care of Animals is the title of a 459-page book recently issued by the Macmillan Co. This well-printed and illustrated volume, which is the latest addition to the admirable Rural Science Series, edited by Prof. L. H. Bailey, of Cornell University, is from the pen of Dr. N. S. Mayo, professor of veterinary science in the Kansas State Agricultural College, and covers in a practical manner a wide range of subjects. It opens with a very helpful chapter in which general advice is given as to the feeding, watering, exercise and protection of animals and the value of giving them personal attention, and the succeeding chapter includes valuable information about the care of animals in stables and yards. In this part of his book the author deals with horse stalls, cow stables, the grooming and clipping of horses, care of the feet, bedding, care of swine, yards and corrals, and quarantine. Under the caption "The Care of Pets," dogs, the breaking of dogs for farm purposes, cats, rabbits and hares, guinea-pigs and pet poultry are discussed. Another chapter is devoted to "The Horse—Judging and Handling." From the farmer's standpoint this chapter is one of the most valuable contributions to equine literature we have examined. Every one who has anything to do with horses should study it and make it a part of his working knowledge. The lameness and shoeing of horses are subjects which Doctor Mayo treats under a number of subheads, describing the diseases and defects which cause lameness and telling how to shoe a horse. The remainder of the book is of a practical veterinary character, so written as to be easily understood by anyone of ordinary intelligence, and comprehends all the common diseases of live stock and outlines simple, effective methods of treatment. The book is not burdened with technical terms. It is made for the practical stockman and farmer, whose requirements for such a work it comes nearer filling than any other work yet published. A copy of it should be in the hands of every one directly interested in the care and management of domestic animals. The price postpaid is \$1.35 from the office of the *Gazette*."

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THE INDUSTRIALIST.

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No. 22

THE SIGNS OF SPRING.

IT GOES without saying that the perennial rejuvenescence of nature in the temperate regions, which we call spring, has from immemorial time awakened a more universal sentiment of joy in the human race than any other natural phenomenon.

The mythology of all peoples is possessed of legends wherein the death and birth of the year is typified in the death and miraculous reappearance of some hero or demigod. This universal feeling of release from bondage, of reëntrance into life with the beginning of spring, has given rise to the greatest of the world's lyrics, and has moved even the most mediocre souls to pour out their pathetic joy in footless verse and effusive prose. The neighborhood poet who, on the passing away of any worthy citizen, adds to the sting of death by his inevitable obituary verse contributed to the county paper—he may be depended upon, all over the length and breadth of the land, to offer oblations to the Muse with each recurring vernal season. It is, in a way, a common thrill of universal life, that awakens the dormant hibernating animals; that causes the earthworms to uncoil and begin to burrow; that calls back the blue-jay to wait for the cherries; that urges the weeds to hasten out of their hiding-places in sundry seeds and pods and burrs; that shatters with emotion, painfully expressed, the soul of the spring poet.

But there is a practical aspect, a business aspect, in which the modern man regards the spring that is quite as interesting and more important for the welfare of the race than the age-long, instinctive, unconsciously joyous participation in the event, by animals and plants; so highly developed in the worship of primitive man and in the play of the child, when for a brief season there awakens even in the breast of the most sophisticated and cynical of worldings, a secret and silent song—a thrill of exaltation over the annual triumph of life over death on this little globe.

The business attitude toward spring, if we may so term it, is signified by the arrival of the spring seed and plant catalogues. Unaffected by the bitter frost, their gorgeous pages blossom out of the mails during the first weeks of January. With what naive and simple joy does the plain man gloat over their alluring contents.

Is there a single one of us who, in reading such a well gotten-up catalogue, does not again become like the small boy gazing in rapt wonder at the resplendant bill-boards of the circus? Despite its annual record of broken promises, despite the fact that the advertised herd of giraffes harnessed to the Roman chariots never races over the actual sawdust; despite the utter failure to materialize, of the "7 White Elephants 7" of the optimistic posters, the small boy, year by year, reads, ponders and inwardly digests every solitary syllable of the advertisements, and shrilly reviews with his fellows the pictorial art of the bill-boards.

Even so, although we think we know better and know that we ought to know better, yet subtly and unconsciously we succumb to the spell of the spell-binder who writes the advertisements for the seedsmen. Who has not bought seed "novelties?" Things that were to be earlier than the earliest, better than the best, and above all bigger than the biggest?

Some of these "novelties" are as old as agriculture. Take for instance the so-called "new" grain, "Corn-wheat," which one catalogue says is a "Much-talked-of cereal, creating considerable interest in western America." From the illustrations of the heads and an examination of the seeds this wonderful novelty is found to be nothing more nor less than Polish wheat, one of the three distinct species belonging to the wheat genus, an inferior cereal grown from time immemorial in some of the less progressive countries of Europe. Teosinte and Pennicillaria, the latter invariably misspelled, are still exploited in most of the catalogues, although neither is as valuable for northern growers for forage purposes as corn and sorghum. White Bokhara, or Sweet Clover, is still offered for sale, despite the well known fact that no stock will eat it, that it is only a biennial and therefore not desirable for permanent pasture, and despite the further fact that it is an abominable weed. The utter lack of any real knowledge of the differences and distinctions between plants is manifested in the habitual use of "Spelz" and "Emmer" as synonyms, whereas they are names

of plants which are perfectly distinct and different from each other, and are found in quite sharply separated groups of the wheat genus. It is amusing to find a number of dealers advertising the soy-bean under the name of the "Japanese Coffee Berry." One catalogue says, "This Japanese bean we find by actual test, when roasted and coarsely ground, tastes so nearly like Brazilian coffee the difference is hardly perceptible." Another dealer calls it "The German Coffee Berry," and says: "While in Germany we took the greatest pains to look up our great German Coffee Berry, and to our surprise and pleasure we found it used in almost all hotels and restaurants in Switzerland, Germany, Holland, and France. They use large quantities, mixing it with Rio and other genuine coffee, and we predict that no novelty offered in years will meet with such a hearty reception as the German Coffee Berry. It is the poor man's friend and the rich man's delight; ripening in Wisconsin and the Dakotas in 4½ months. It is wonderfully productive, and is destined to save the American housekeepers and farmers millions of dollars each year. It is certainly the best berry to mix in with other coffee we ever saw; half-and-half will produce a drink claimed by many to be equal to a good cup of Rio."

But he has still another, that he designates by the grotesque name of "Japanese Jaavaa Coffee," that appears to be nothing more than another variety of soja bean. Concerning this wonderful plant he announces; "Travelers in Corea and Japan and missionaries on duty in these countries have long referred to a berry that was used there as a coffee substitute. Customers have written us regarding this coffee. Some call it Idaho Coffee, the Colorado Coffee, the California Java, and Domestic Coffee Berry. We obtained a supply of seed, have grown it here in the North, and find that in some respects it is superior to our great German Coffee Berry, and we offer it as a fit companion to this most remarkable novelty in the coffee substitute line. The berry is larger, is different shaped, and the growth of the plant is somewhat different from the German Coffee Berry. It is certainly a healthier drink than genuine coffee, and we are sure that those using same will not regret it."

The "Jaavaa" comes fifty cents higher by the pound than the "German." Why not, with such a title? The odd part of the matter is that the self-same dealers in other places in their cata-

logues offer for considerably less the same article under its legitimate name, the soja or soy-bean.

Of late years, since drought-resistant crops have come into such demand in the West, there has arisen a great sale for all the sorghum tribe. Such varieties as Kafir-corn, millo maize, Jerusalem corn, dhourra, and sorghum or cane. All of these have a number of cultivated forms, and most of the western stations have experimented with them, and are prepared to make specific recommendations. And yet many seed dealers in describing them cheerfully announce that each is more prolific and more drought-resistant than all the rest individually and collectively.

There seems to be a gradual tendency among the seedsmen and plant dealers to say less of recent years about the Mayberry and the Wineberry. One scarcely finds *Solanum muricatum*, the Pepino or Melon pear, offered nowadays. Although this is a rather good fruit, and in Guatamala bears abundantly, in this country it produces sparingly and will not mature out of doors. Time was when every well-regulated seed catalogue sold this "wonderful" plant. There are successors to these, however, and the most prominent and appetizing bait that is being thrown out is ginseng. Somebody grows a square rod of it, and by the mere act of multiplication proves that there is a profit of several thousands of dollars per acre to be had from the culture of this plant. It is unnecessary to discuss the matter here. The U. S. Department of Agriculture, has a good "farmers' bulletin" on the subject. In running through the seed and plant catalogues, however, one finds all sorts of statements. The lower grade dealers generally fairly scream its merits and its profits into the expanded ears of a gullible public. The best seedsmen either simply offer ginseng for sale or, as in the case of one of the most prominent and successful, warily caution their constituency against overconfidence. The one just referred to, indeed, informs his customers with refreshing candor, that if there were all the money in ginseng that the enthusiasts claim, he would go out of business as a general seedsmen, and cultivate the millionaire habit by raising ginseng exclusively. Still, he says, if people have to have it, here it is, and as good as anybody's, if not better. One sometimes wonders why the men who write the books on "How to Make Money" are never heard of on Wall street. Why, by the same token, do all the gen-

erous, altruistic seedsmen want all this easy coining of wealth to be done by the plain people; themselves, alas! resignedly content with the knowledge that "he also serves who only stands and waits"—on customers. One is reminded of the grumbling Agamemnon, who, bearing the brunt and toil of the conflict, yet when the rich cities were looted, bore off, forsooth, as his share of the spoil and the plunder, just "some small wretched thing" to his ships and his fellows.

One concludes, on a careful perusal of the American seed catalogues, that the majority of them count on the lack of education in their buying public, as excusing their own slovenly, careless, or reckless statements regarding their goods. It is evident that there is a great difference in this respect between the eastern and the western dealers, for the most part. The former have a more discriminating, better educated and more critical public to deal with. Indeed, one of the highest grade plant dealers in the East has gone so far as to present his plants under scrupulously accurate scientific names, revised for him by Doctor Britton, the most eminent American systematist, so far as the flowering plants are concerned. To western buyers the caution should be, do not buy of dealers who indulge in the florid tropical style of advertising. Do not buy of the cheapest dealer, whoever he is. Do not take the dealer's word for his plants. He is not the man who raises either the plants or the seeds for the most part. His business is to advertise and *sell* them, and no matter how much his catalogue promises, he binds himself by no warranty. The rule of *caveat emptor* applies. If a plant is new, write to the experiment station and find out about it. It is a part of the business of an experiment station to lose money trying the things the seed dealers advertise in big type, and gaudily colored prints. Owing to the very fact that the majority of the seedsmen have their seeds grown for them by others from Maine to California, they themselves are in a measure subjected to possible deception and imposition on the part of their growers, and so, of course, they have had to protect themselves by expressly stating that they do not give any warranty, expressed or implied, "as to description, quality, productiveness, or any other matter connected with the seeds," etc. In this, however, there lies a possible unfair advantage to the seedsman over the purchaser. He need set no limit to boldness of assertion or extravagance of exaggeration in his

advertisements of the prospective behaviour of his seeds or plants. And yet in the same breath he can decline all responsibility for the correctness of his own assertions. It certainly seems just that seedsmen should be held responsible at least for the description and quality of their seeds. Both the purity of seed and their percentage germination can be determined for large quantities with an accuracy capable of a mathematical calculation through the investigation of small lots taken by the process of "random sampling."

It is unfortunately the fact that the average layman does not approach the seed catalogue armed with a fore-knowledge of what is to be expected of plants and what plants are best adapted to his soil and climatic conditions. If wonders are promised, wonders are expected. A seed is supposed to be a machine that can be depended upon automatically to work according to a fixed schedule in its development into a mature plant. Owing to the fact that the behavior of seeds cannot be confidently predicted in all respects, particularly under new conditions of soil and climate, the seedsman is often unjustly blamed by the purchaser. Living things, whether seeds or horses, have certain tendencies due to ancestry and breeding that we can count upon; they have also numerous individual peculiarities that may crop out unexpectedly, and of the existence of which no one can possibly be aware.

It seems self-evident that a dealer should be held responsible for accuracy in his descriptions, at least in so far as that he should be compelled to insure or guarantee that a given package actually contains seed of the particular species or variety it purports to contain.

Some of the better seed dealers are beginning to take pains to secure the correct botanical names of the things they offer. The seed and plant catalogues of the great firms of Haage & Schmidt, of Germany, and Vilmorin-Andrieux & Co., of France, which do a world-wide business, sell under botanical names and, what is equally important, sell by number. It simplifies business to be able to order, say, No. 8728 rather than to be obliged to write "Smith's Monster Extra Early White Purple-topped Turnip." It certainly makes for commercial honesty as well as for scientific accuracy and general enlightenment to say *Panicum crus galli* rather than "Billion Dollar Grass." But the American seed dealers, for the most part, recognize that it is advertising that sells.

This flamboyant advertising, though effective for a time, and particularly with the less educated public, is likely to become less and less so, as the agricultural class, which constitutes the chief source of income of the seedsmen, becomes better and better informed. Indeed, in this day and generation, with experiment stations in all the states, equipped with their corps of experts ready to answer all inquiries from farmers, one who buys seed blindly on the basis of the assumptions of scare-head advertisements, deserves to be taken in. The man who bought "Bohemian oats" a few years ago was probably the same one who, seduced by the psychic influences of a gorgeous flapping poster and the stentorian voice of a brass-lunged fakir, went into the circus side-show to see a wonderful horse "With His Head Where His Tail Ought To Be" and found a common ordinary beast looking over the rear end of a box-stall.

H. F. ROBERTS.

SOME PHASES OF LIBRARY PROGRESS.

WITHIN the last fifteen years a change has come over the spirit of those interested in libraries; a change for the better that has affected the growth and status of the library and revolutionized to a great extent its methods of administration, thereby increasing its usefulness. Many influences have conspired to bring this about. State library commissions; interstate, state and district associations; traveling and branch libraries inter-library loans and exchanges; library training schools; coöperation with teachers; coöperative cataloguing; open shelves; princely gifts from philanthropists of splendid buildings and endowments; and compulsory library legislation—only three states in the Union being without library legislation of some kind: Alabama, Arkansas, and Nevada.

It is only about a half-century ago that the modern library received its first legislative assistance. And as the years have passed since that time the function and value of the institution as an important factor of popular education has been more and more recognized, until the library has come to be accepted not only as an indispensable adjunct to the school and college, but a very essential agency towards elevating the moral and intellectual standard of the general public.

Grateful for their own share in the public welfare and appreciating the benefits to this and future generations, philanthropists

and men of wealth have made unprecedented gifts to establish libraries. Many millions have been given for this purpose. Sixty million or more has been proffered the United States in the last three years.

Libraries costing from a thousand dollars up among the millions have been erected over a wide extent of country. They are partly the result of local effort and partly the result of gift. The old-time library had for its object, accumulation, and its principal care was for the books, lying on the shelves largely unused and collecting dust and in some instances chained fast. A different spirit pervades the library of to-day—a spirit that is humane and helpful; a spirit that would awaken the interests of the public and urge the book upon those who would not seek it for themselves. The atmosphere is kindy and sympathetic, and the broadest spirit of hospitality prevails; free access to the shelves is granted, and everything done to serve the interest of the reader and bring the student in close contact with the books.

The modern librarian, who well might choose the royal motto, "Ich Dien," is alert for anything that may improve the service of the library and extend its field of usefulness, realizing that it is a direct educational work that the library has to do, and that it is destined to play an important part in raising the standard of citizenship.

It has been well said "that the public library forms one side of a grand trinity as a means of public advancement—the library, the school, and the church; its base, the public school; the church, with its moral teachings and care for the spiritual man, forms one of the sides; the public library forms the other, by its broad and general training of all classes and sects."

Inventive genius has kept step with the march of progress since the time of the old hand-press, and has multiplied the number of books and made them more easily obtained. Photo-engraving and other methods of illustrating have taken the place of wood engraving, now almost a lost art, making the books not only more artistic but more attractive and instructive. From this wealth of material, librarians may choose the best books in the range of human knowledge; books of recreation, books of information, and books of inspiration, according to the especial needs of the institution and its educational aims.

"The true university is a collection of books, and all books are

to teach us to read," and these collections in the library of to-day are catalogued and classified and placed on the shelves in a systematic order, and to meet the growing necessity, colleges and schools are beginning to teach the use of the library.

Library science has been added to the curriculum. A comprehensive knowledge of the classification system and the use of the catalogue is taught, besides a thorough knowledge of the use of books.

The librarian knowing the resources of the library is ready to coöperate with the teacher. If he is to have his hand on the pulse of the whole institution, there must be coöperation; he must know each day the subjects being presented and be ready to guide the student in his search for information and seek to give cordial and efficient aid.

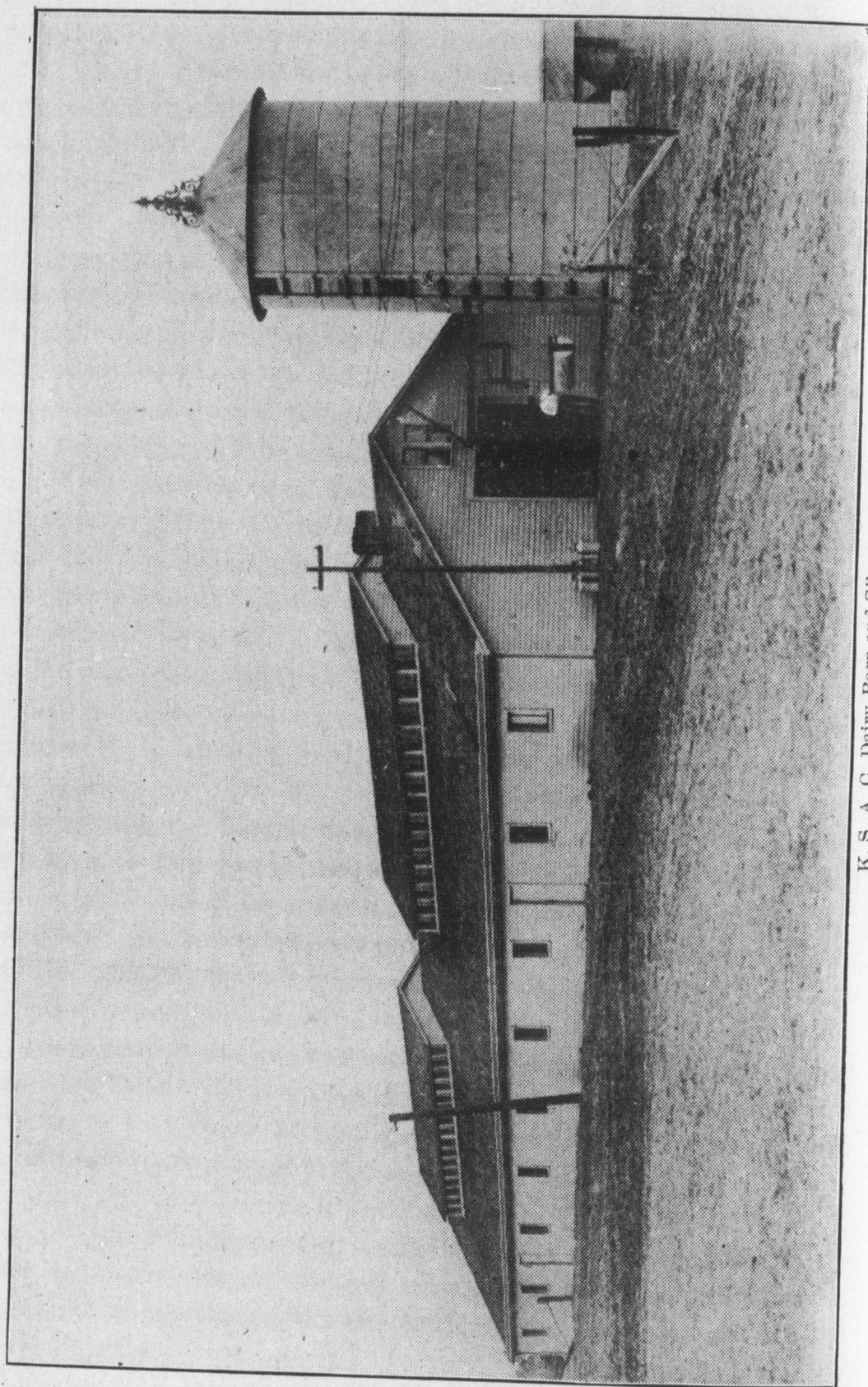
Melvil Dewey said, "To my thinking, a great librarian must have a clear head, a strong hand, and above all a great heart; such shall be the greatest among librarians, and when I look into the future, I am inclined to think that most of the men who will achieve this greatness will be women." Although Mr. Dewey speaks as one having authority, we would not venture an opinion as to the fulfillment of this prophecy.

Whatever the future may develop in librarianship, it is true that many women now fill the position of librarian acceptably and that more women than men attend library schools and associations. One does not need to be a prophet to see that coöperation tends to economy and uniformity in library methods.

The library of Congress, which was maintained the past year at a cost of \$76,848, is becoming more and more a national library, and it is among the possibilities of the future that this splendid library, with its million volumes, may become the center of a uniform system of libraries, and it is safe to say the spirit that will preside over them will be the spirit of progress.

GERTRUDE A. BARNES.

The committee on revision of courses, appointed at the last meeting of the Board of Regents, met the Faculty this afternoon for the purpose of a general discussion of a number of the many vexing problems that grow out of every change. The results will be placed before the Board at their April meeting and published in the next catalogue.



K. S. A. C. Dairy Barn and Silo.

THE INDUSTRIALIST.

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LOCAL NOTES.

Arbor day will be April 7.

Winter Term closes March 25.

Spring Term begins March 29.

Manhattan has received \$657.25 as her share of the semiannual disbursement of the interest of the State school fund.

The College battalion is giving dress parade in front of Anderson Hall every Thursday and Saturday morning.

Doctor Mayo and Captain Shaffer are first-class wheelmen. Friday of last week they made a wheel trip to Fort Riley and back.

Prof. E. Deere, of Bethany College, was at College last week to advertise the "Messiah," to be given at Lindsborg March 27, 28, and 29.

Chancellor Strong of the State University attended chapel exercises on Tuesday morning and addressed the students on "The Unity of the Kansas School System."

Senior student Glenn Edgerton, of the electrical engineering course, received notice last week of his appointment as a cadet to West Point. He will go there next June.

There will be a stock-judging contest at the College barn on March 21, between the students of the several classes in the regular agricultural course, the first- and second-year short courses, the dairy course, and the special students in agriculture. The contest will be conducted under the management of the Department of Animal Husbandry and the best judges will receive prizes aggregating about \$100 in value, contributed by Manhattan merchants and business men generally. The contest promises to be spirited and interesting.

The play "Nathan Hale" was given last Thursday night at the Manhattan opera-house by home talent, for the benefit of the City Library Association. The house was packed to its last seat and the performance was highly creditable to the troupe, which consisted almost entirely of "College people." We congratulate the young men and young women for their effort, and especially the hero, Nathan Hale, and his sweetheart Alice, who were represented by senior student R. D. Scott and graduate Maude Irene Failyer. The former acted also as director and trainer and deserves credit for his efficient work.

The seventh number of the College lecture course was given last Monday night in the College chapel by the well-known cartoonist, C. Edgar Rosecrans. It consisted of numerous crayon sketches, musical monologues, illustrated songs and musical burlesques, and was highly enjoyed by all present. "Ross Crane" is certainly an artist of rare ability and a clever entertainer. The next and last lecture will be given by Col. Geo. W. Bain, on April 1.

Last Monday night about one hundred seventy-five members of the Y. M. C. A., together with a number of invited guests, enjoyed, in the Women's Gymnasium, their first annual banquet. The hall was decorated with groups of palms and streamers of red, white, and blue. Chancellor Strong, of the University, President Nichols, T. W. Buell and others made short addresses, and the happy participants sang a number of choruses. The dainties were served by the members of the Y. W. C. A. Professor Eyer acted as toastmaster.

The demand for the College mixture for killing prairie-dogs continues without abatement. Agent D. E. Lantz, who has charge of the poison laboratory, reports that the total sales of the present year already amount to about \$5000, while last year they were only \$4200, and the year before \$4800. The liquid poison is sold, securely packed, in half-gallon cans, and is shipped to any address in the State at actual cost of materials. Millions of prairie-dogs have been killed with this mixture in the western part of the State the past three years.

For some time various articles have been disappearing from some of the departments. At one time the Printing Department had the cash drawer relieved of four or five dollars and a number of stamps. The library, Secretary's office and D. S. hall have missed articles of various kinds, usually cash. Last Sunday Janitor Lewis saw two boys enter Kedzie Hall, using keys at the side door. He yelled to Superintendent Rickman, and together they rushed over. They succeeded in catching the younger boy, but the other escaped. Fred Krotzer, the one captured, is only thirteen years old. He told them that his partner in crime was Albert Deere, who is sixteen years old. A large number of keys were found in their possession.—*Herald*.

REDUCED RATES TO CALIFORNIA, MARCH 1 TO APRIL 30.—That long-looked-for California opportunity is here at last. March 1 to April 30, the Rock Island System will sell "tourist" tickets to principal points in California at these low rates: \$25 from Missouri River Points: \$25 from Manhattan, Kan. Tickets are good in tourists sleepers, which the Rock Island runs daily, Chicago and Kansas City to Los Angeles and San Francisco by way of El Paso; three times a week via Colorado Springs and Salt Lake City. March and April are the pleasantest months of the California year—doubly so because, at home, they are usually the very opposite. Tickets and berths at all Rock Island ticket offices, or by addressing A. E. Cooper, D. P. A., Topeka, or J. A. Stewart, G. A. P. D., Kansas City.

The Electrical Engineering Department has recently bought the Wood arc-lamp dynamo of the Manhattan Electric Light Company, for use of the classes in light testing.

The contract for the new College waterworks will be awarded next Monday, and work will begin at once. Regents Berry and McDowell are expected to be here to let the job.

The College baseball team will go to Lindsborg on the twenty-eighth of this month, to play their first program game and take in the fifty-sixth performance of the "Messiah," given by the musical department of that College.

ALUMNI AND FORMER STUDENTS.

George C. Peck, '84, is grain buyer and agent for the Midland Elevator Company, Junction City, Kan.

H. A. Avery, '02, visited College last week. He is succeeding well in the hardware business at Wakefield, Kan.

C. A. Murphy, '87, has abandoned the ranks of pedagogy and is now editor and proprietor of *The Argosy*, Nickerson, Kan.

Effie Gilstrap-Frazier, '92, is now a clerk in the Chandler, Oklahoma, post office. Our readers may recall that Mr. Frazier died four years ago.

Jesse M. Jones, '03, has purchased a farm near Montgomery, Ala., and will manage it. His address will be R. F. D. No. 4, Montgomery, Ala.

F. O. Woestemeyer, '99, is in the senior class in the Theological School of Cumberland University, Lebanon, Tenn. He will be graduated from that school May 10 with the degree of Bachelor of Divinity.

Through the courtesy of Prof. F. C. Sears, '92, director of the Nova Scotia School of Horticulture, we are in receipt of the annual report of that institution, by which we learn of the good work he is doing there.

Arch Campbell, second-year student 1891, who spent several days with his father, Rev. Wm. Campbell, left Saturday. He has a very responsible position in the office of the general manager of the Rock Island.—*Nationalist*.

J. H. Oesterhaus, '01, has just completed the junior year of the Kansas City Veterinary College. Through the summer vacation he will have charge of the dog ward and the library of the institution, and expects to take the senior work there next fall.

W. A. Anderson, '91, is now manager of the Pacific Coast Lumber & Shingle Department of the Long-Bell Lumber Company. His office is in the Keith & Perry Building, Kansas City, Mo., where he will be glad to see his friends when they are visiting in the city.

Alexis J. Reed, '03, is prospering and enjoying his work as a special apprentice with the Western Electric Company, Chicago, Ill. His address is 197 East Blackhawk street.

Dr. Chas. Eastman ['02] came from Kansas City Wednesday to spend a few days with friends. Tuesday evening he graduated from the Kansas City Veterinary College.—*Nationalist*, March 18.

E. H. Kern, '84, Grand Junction, Colo., is again practicing his chosen profession, that of a civil engineer, and with good success. He writes of continued interest in all that pertains to the old College and its work, and sends his best wishes to all old acquaintances.

The *University of Colorado Studies*, in its February number, contains two abstruse mathematical articles by Arnold Emch, who received the degree of Master of Science from this institution in 1894 and is now associate professor of mathematics in the University of Colorado.

P. H. Ross, '02, assistant in the Agricultural Experiment Station at Kenai, Alaska, sends greeting to his old friends and expresses satisfaction with the prosperity and progress of the College, of which he learns through the *INDUSTRIALIST*. He finds the climate less severe than he expected to, but once a month seems a long time between mails. He takes the matter philosophically, however, and is thankful if it comes promptly with even that frequency.

W. E. Smith, '93, sends the following notice: Dear Friends—The Kansas City branch of the Alumni Association of the Agricultural College will hold its banquet at the Midland Hotel on the night of March 26, 1904, commencing at 7 P. M. This association comprehends all those who have attended College, and each one's wife or husband. Plates will be \$1.50 each, and you should at once, if you desire to come, mail to W. E. Smith, secretary, 814 N. Y. Life building, Kansas City, Mo., an amount of money equivalent to the number of plates you desire. You should reply at once so that we may determine how many plates we must provide. Tell all that you see to write the secretary at once. This will be the only notice.

Chas. H. Thompson, '93, whose recent appointment was noted in this department, writes as follows concerning his new work: "I am now permanently employed at this place, having been appointed to take charge of the living collection of succulent plants, which embodies about sixteen thousand individuals. The position affords the best of opportunity for scientific research, to which most of my time will be devoted. My special group for such study will be the cacti—an 'all American' family—much neglected, much abused, yet one of the most interesting groups that a botanist or any one else may come in contact with. Shall be glad to meet any College people who may be traveling about St. Louis this summer.

Historical Society

VOL. 30

NO. 23

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ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE


♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
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♦ ♦ ♦

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NO 23

LOUISIANA.

ONE hundred years ago on the twentieth day of last December, the French flag at New Orleans was officially replaced by the Stars and Stripes, and Louisiana came into the actual possession of the United States. The approaching celebration of this purchase by the exposition at St. Louis is the chief excuse for reviewing some of the points concerning the history of Louisiana and the significance of its addition to our territory. The name Louisiana was at first applied to the entire Mississippi river basin extending from the Alleghenies to the Rockies and from the Lakes to the Gulf. By right of discovery, based especially on the work of De Soto, Spain won the first claim to this vast empire. France, however, through actual occupation, following the exploration by Marquette, La Salle, and others, of the entire course of the Father of Waters, secured a first valid claim to real possession. Louisiana, then, as France first owned it, included all the land whose waters drained into the Mississippi river. This made an empire of very irregular outline. On the north the boundary line ran a short distance south of the lakes, thence between the sources of the Mississippi river and the Red River of the North, thence northwestward up into Canada, and thence southwestward following the divide or watershed until it reached the Rockies just south of the forty-ninth parallel. The Allegheny mountains formed most of the eastern demarcation. South of these the Perdido river was chosen as the boundary between French Louisiana on the one side and the English colonies and Spanish Florida on the other. This river is in part the present western boundary of Florida. The Rockies formed a part of the western limit, but on the southwest the exact boundary was soon a matter of dispute. It may or may not have included Texas. It certainly did not include the Oregon country.

It should be remembered that France also owned Canada, or

"New France." It was the attempt to connect the St. Lawrence and the Mississippi by a chain of forts through the Ohio country that brought the French frontiersmen into conflict with the English settlers, especially those of western Pennsylvania and Virginia, and thus precipitated the French and Indian War—destined to be fraught with important results for America. This war began in 1754, drifted into what is known as the Seven Years' War in Europe, and was closed by the treaty of Paris, in 1763. During the latter part of this war Spain helped France against England. The results of the war were decisive and important. France surrendered to England a vast empire, including Canada and all of Louisiana east of the Mississippi and of the Iberville river. During the war, England had conquered Havana (as well as Manila) and now returned Cuba to Spain in exchange for Florida. Thus England now owned Canada and all the territory that lies east of the Mississippi river except the island on which New Orleans stands and two small islands in the Gulf of St. Lawrence. These two islands in the St. Lawrence are the only possessions in North America that France continued to hold. The name Louisiana now came to be confined to that part of the territory lying west of the Mississippi river, and including the island on which New Orleans stands. But at the same date as that which closed the French and Indian war France ceded to Spain this Louisiana, so that Spain now owned all of North America west of the Mississippi and of the Iberville. This status continued for twenty years. At the close of the American revolution the United States became independent of England, and Florida was ceded to Spain.

The next change in the ownership of Louisiana occurred October 1, 1800, when, by the secret treaty of St. Ildefonso, Spain retroceded to France Louisiana "with the same extent that it now has in the hands of Spain, and that it had when France possessed it." As compensation, Napoleon was to place a Spanish prince on an Italian throne. This definition of boundary was both uncertain and contradictory. The southeastern boundary of Louisiana, as Spain owned it, extended only to the Iberville—that is, included the island of New Orleans only on the eastern side of the Mississippi river; but when France had possessed it, it extended to the Perdido—that is, to the present western boundary of Florida. The United States claimed the Perdido as the intended boundary.

Spain maintained that the Iberville was intended. There were also doubts as to whether the territory now known as Texas was to be considered a part of Louisiana. We did not urge the latter claim, though we probably had a better right to Texas than to West Florida.

To understand the situation clearly, it must be remembered that at this time Napoleon Bonaparte was at the head of the French nation and waging war on the rest of the European world, and that England was his most formidable enemy. Now when Napoleon, for France, gained possession of Louisiana it changed very materially our attitude toward this territory and its owner. Spain was a weak and declining power. The retrocession of Louisiana to France placed the United States between the two chief belligerents of Europe—England on the north and France on the west. This state of affairs greatly agitated the Americans. It was under these conditions, in part, that President Jefferson, an avowed friend of France and enemy of England, wrote under date of April 18, 1802, to Robert R. Livingston, minister to France, as follows: "There is on the globe one single spot, the possessor of which is our natural and habitual enemy. It is New Orleans, through which the produce of three-eighths of our territory must pass to market. France, placing herself in that door, assumes to us the attitude of defiance. . . . From that moment we must marry ourselves to the British fleet and nation."

Jefferson here notes the vital point involved. The mouth of the Mississippi river was always within the Louisiana territory. Now it happened that the United States was vitally interested in the navigation of this river. The great West—that vast region between the Alleghenies and the Mississippi—had been rapidly filling with new settlers of the hardy frontier type. There was no available means of transporting their goods over the mountains eastward, while on the other hand their natural commercial outlet was down the Ohio and Mississippi rivers. Of course, goods sent down in river boats had to be landed near the Gulf and re-shipped in ocean vessels. By the terms of Pinkney's treaty of 1795, between the United States and Spain, we had been granted the right of depositing our goods at New Orleans to be thence re-shipped.

October 2, 1802, the Spanish government withdrew this right

of deposit and the ferment in the West that had been caused by the retrocession of Louisiana was hereby greatly increased. These frontiersmen threatened to secede from the United States unless the government would secure a continuance of the right of deposit. "In Congress James Ross, Senator from Pennsylvania, introduced resolutions authorizing the President to call out fifty thousand militia and take possession of New Orleans. Instead of this, Congress appropriated two million dollars for the purchase of New Orleans, and the President, January 10, 1803, sent James Monroe as minister extraordinary, with discretionary powers, to coöperate with Livingston in the proposed purchase."

Now it happened that Napoleon had dreams of a great colonial empire in America. He had sent an army to suppress rebellion in Hayti, but this great army had been completely defeated by the Blacks under their negro leader, Toussaint L' Ouverture. Thus was Napoleon's dream of empire shattered. Moreover, it was evident that the peace between France and Europe was about to end and war to be renewed. Napoleon realized that if he tried to hold Louisiana, England, mistress of the seas, would surely conquer it. He needed money, and he wished the friendship of America. Under these conditions he suddenly offered to Livingston through Talleyrand not simply New Orleans but the whole of Louisiana. To say that Livingston was surprised is to state the case all too mildly. As President Roosevelt says, "The statesmen at Washington received the proposition with positive alarm, and cared only to acquire New Orleans." Even President Jefferson thought that the Constitution did not confer power to purchase this territory. Yet the opportunity was too large, and the purchase was made. The American commissioners offered at first ten million dollars, but finally agreed to pay fifteen million, although it is now known that Napoleon had instructed his minister to sell for less if necessary. The treaty was signed April 30, 1803, by Livingston and Monroe on one part and Barbe-Marbois for France on the other.

Many are the points of interest that are connected with this great purchase. First might be noted the question of the constitutionality of adding territory to the original United States by purchase. This question was thoroughly discussed. Certainly no definite grant of such power is to be found in the Constitution, though it has come to be recognized as in keeping with the spirit

of the Constitution. It will be recalled that President Jefferson himself believed it unconstitutional to purchase Louisiana for fifteen million dollars, though he seems to have thought it would be perfectly in keeping with the spirit of the Constitution to purchase New Orleans for two millions.

Again, it will be recalled that Jefferson's party was chiefly composed of the settlers in the South and West—the very people who had demanded this purchase. And in this connection we remember that Jefferson's party had been known as the strict construction party—favoring state rights but opposing the exercise of power by the national government—while on the other hand the Federalists of New England had favored a broad and liberal construction of the Constitution so as to strengthen the central government. In the Louisiana purchase these conditions were just reversed, the Anti-Federalists, now coming to be known as the Democratic-Republican party, were driven to the broadest construction of the powers of the general government, whereas the New England Federalists even went so far in their opposition to this increase of national powers that they actually threatened to secede from the Union, both at the time of the purchase and again when Louisiana applied for admission to statehood. Thus were the parties of the different sections of our country brought to a more nearly mutual understanding or feeling as to what our nation should mean.

The boundary of this great expanse of territory that no white man had ever explored was of course indefinite, especially in the southwest and the southeast. The United States claimed that Louisiana included West Florida to the Perdido river, which Spain of course denied. We also claimed Texas, to which we had a better right. It will be recalled that Spain owned Florida and all of the territory southwest of Louisiana. This boundary dispute was not settled until the United States purchased Florida from Spain, in 1819, when the southwestern boundary of Louisiana was defined to be as follows: "Beginning at the mouth of the Sabine in the Gulf of Mexico; up the west bank of the Sabine to the 32d degree of north latitude; thence north to the Red river; along the south bank of the Red river to the 100th degree of longitude east from Greenwich; thence north to the Arkansas; thence along the south bank of the Arkansas to its source; thence south or north as the case might be, to the 42d degree of north latitude, and

along that parallel to the Pacific." It is of interest to note in this connection that all of Kansas except the southwestern corner was included within this limit. This corner was secured at the close of the Mexican war.

Much has been said as to whether it was Livingston or Monroe or Jefferson that deserves the credit for the Louisiana purchase. President Roosevelt, in his *Winning of the West*, says, "The winning of Louisiana was due to no one man, and least of all to any statesman or set of statesmen. It followed inevitably upon the great westward thrust of the settler folk; a thrust which was delivered blindly, but which no rival race could parry until it was stopped by the ocean itself." This is doubtlessly the true statement of the case, and it is full of suggestion. The Mississippi river never formed a natural boundary for a nation. Instead of opposing a barrier, it actually invited our frontiersmen to its westward reaching valleys. And the Louisiana purchase prolonged for years that important element in our national life and character—the great American frontier. It is the virile West that has largely made American policy—whether Henry Clay's "American policy" of national roads and protective tariff, or the slavery question, or silver, or an Isthmian canal. It is distinctly the frontier that has transformed neighborly Swede and German and Irish and Scotch into the American. Moreover, it is largely our life of frontier clearing of the wilderness that has made us a nation of laborers, a nation of large and high ideals—of magnificent dreams which we in turn so rapidly transform into accomplished fact.

A fitting close to an article on Louisiana would be the quotation from Emerson, where in his *Young American* he says: "We cannot look on the freedom of this country, in connection with its youth, without a presentiment that here shall laws and institutions exist on some scale of proportion to the majesty of nature. To men legislating for the area betwixt the two oceans, betwixt the snows and the tropics, somewhat of the grandeur of nature will infuse itself into the code. . . . It seems so easy for America to inspire and express the most expansive and humane spirit; new-born, free, healthful, strong, the land of the laborer, of the democrat, of the philanthropist, of the believer, of the saint, she should speak for the human race. It is the country of the future. From Washington, proverbially the city of magnifi-

cent distances, through all its cities, states, and territories, it is a country of beginnings, of projects, of designs, and expectations."

RALPH R. PRICE.

FARM BOOKKEEPING.

THE Kansas farmer of to-day is prosperous. There is no kind of business which will approach that of farming from the financial standpoint of liberal and sure percentage of gain for the amount of money invested. Still the farmer seldom keeps books.

Every other business man who makes any pretense of being successful in a financial way must keep a more or less accurate system of accounts. The one who has the best system of accounts and the most accurate details as to the workings of his business is usually the most successful. He plans his business campaigns with a confidence backed by an intimate knowledge of the details of his business. He knows which department of his business is paying him the highest per cent of profit, and is forewarned of the one which threatens a loss in time to reconstruct and change his loss to gain.

The farmer does not have to keep a set of books, and is generally successful; the merchant must keep a set of books and is generally unsuccessful. If the former would make a practice of keeping a simple set of accounts, a failure in the farming business would be a very rare occurrence; if a merchant would make a practice of not keeping a set of accounts, success in the mercantile business would be equally rare.

At first sight it would seem necessary that the merchant should keep a set of books, but why should it not be just as necessary for the farmer to do the same? A slight consideration of the question will convince any one that for the farmer bookkeeping is just as desirable and necessary. The farmer seldom realizes that he is engaged in such a profitable business, and in spite of the slipshod methods, or no method at all, which he uses in keeping his accounts, he is still successful. The merchant seldom realizes that he is using an antiquated system of accounts which does not give him the results necessary to have an intelligent conception of his business. Too often the final result is that the farmer has the mortgage foreclosed and the merchant must make an assignment.

It seems strange that a business of such high standing as

farming is still conducted by methods which show an utter disregard of ordinary business principles. Conditions are sure to change from year to year, and before many years a decided improvement will be apparent. When a merchant fails in business or becomes financially embarrassed, his books are immediately examined to find his exact condition. When a farmer becomes close pressed for money, the mortgage is foreclosed or the accounts of the creditors are examined. The farmer himself seldom has sufficient accounts worth investigating. Though the farmer is generally successful and still has no system of accounts, this is no reason for continuing such a lack of method, for it shows a disregard of the first principles of business. If a farmer can be successful without a system of accounts, he can be much more successful with a system. It is reasonable to suppose that the man who knows the details of his business, who knows where he is losing and where he is gaining, can avoid the future losses and continue the future gains.

The advantages of a system of accounts are many. Even a simple system, such as could be installed by anyone of average intelligence, would be of great benefit to any farmer.

It detects the small leaks.—The farmer may not realize the importance of little things, but in the aggregate these little things become very important. He wastes annually enough to make the total, if saved, show as a handsome profit. Need I mention any of them? A couple of very apparent ones on most farms are the carelessness in which machinery is left uncovered when not in use; careless methods of feeding with the attendant wastes.

It shows the losses.—If the farmer keeps an account with field number one, charging up to that field all of the work and materials put on it and credits that field with the amount of grain produced at market prices, he can readily see whether that field is proving to be a good investment. If he finds that this field is not bringing adequate returns, nor prospects, he would be foolish if he did not change to something else. If he finds that his herd of scrub cattle is not bringing him a fair price for the feed required to fatten them, he will soon learn that it is poor economy to keep anything but well-bred stock.

It shows the gains.—He will soon learn what department of his farm is bringing the gains and certainly will bend every effort

toward increasing the size of that department. If he finds that his ten-acre field of one of the small grains is bringing him better returns than another field of a different kind, he will increase the one and decrease the other. He will, in short, mix more brains with his work and get commensurate financial gains.

It promotes economy.—If the keeping of accounts had no other direct benefit, I would urge it from the simple fact that it promotes economy. The farmer who keeps a detailed account of his expenditures can readily tell, by referring to his cash-book, the exact reason for the diminishing of his cash. He will surely take immediate steps to stop any extravagance. It may be possible to find an extravagant man who keeps a detailed account of his expenditures, but I doubt it.

It encourages enterprise.—Again I would urge the keeping of accounts because it makes a man enterprising. A lazy farmer would not care to keep accounts, but if he did, or if any farmer did, it would force upon him a duty which would react beneficially in many ways. One of the most apparent effects of such a course would be that he would become more energetic from the very fact that he has an increased knowledge of every department of the farm. His neighbors would look up to him as a progressive man.

It shows the yearly earnings.—How many farmers take an invoice the first of the year and make up a balance-sheet which tells them their expenses for the year, earnings for the year, increase of the value of their property, net profits for the year? Very few. They live from one year's end to the other content to let the varying hand of fortune increase or diminish their capital, and seldom knowing which. The idea of finding the percentage of earnings on the amount of money invested is foreign to most of them. The keeping of a set of accounts would be worth the time and trouble if for no other reason than that it would give this knowledge of the yearly earnings.

If the Kansas farmer in general would adopt a system of accounts, be it ever so simple, he would by that one innovation raise his calling to a standard more in keeping with its importance. The common notion that anyone can farm would become an obsolete phrase. The successful farmer would become more successful, and the unsuccessful farmer would become an object of curiosity because of his rarity.

O. H. HALSTEAD.

STUDENT ORGANIZATIONS.

THE students of the Kansas State Agricultural College have several organizations worthy of comment. There are six literary societies—the Websters and Hamiltons, being composed of young men only, and the Franklins of both young men and young women, meet on Saturday evening; the Ionian, for young women, and the Alpha Beta, mixed, meet on Saturday afternoon. The Agricultural Association is composed of those most interested in agriculture, and here, on Saturday evening, subjects most interesting to this class of students are discussed. The society halls are furnished by the College, including heat and light, free, but the various organizations supply their needed paraphernalia. Each hold regular weekly meetings, the programs being announced two weeks in advance. That these societies are doing much good cannot be doubted. There is a friendly rivalry between them that helps to spur them on to better work—to excel. Each year most of the societies give an annual exhibition, sometimes selecting and successfully reproducing heavy Shakesperian plays. It is well worth one's while to visit any of the regular sessions.

Perhaps the organization doing the most good from a humane standpoint are the Y. M. and Y. W. C. A. The Y. M. C. A. this year has charge of one of the large dormitories for headquarters. Here they hold regular meetings, have numerous social gatherings, and try to make it homelike for any and all who will accept their hospitality. Though a small membership fee is charged, the organization is supported principally by donations. The Y. W. C. A. is working hand-in-hand with the young men, and this year they are supporting a "Y. W. C. A. Home." Each of these associations are thoroughly organized and are doing a grand and noble work. At the beginning of each term "New Student Committees" meet all the incoming trains, extend a friendly hand to the new students, take them to headquarters, and assist them in securing good boarding and rooming places. Many a student has been befriended and taken care of by these organizations during a spell of sickness, and the attitude of the organizations does not depend upon their being members—if students are sick or in need, they find willing hands and cheerful hearts to do all in their power. Another commendable part of their work is their employment bureaus. If a student wishes to find employment, he may regis-

ter at headquarters and a committee will look after him. If a person wishes to employ student labor, he makes this fact known and a committee will attend to getting the proper person. Each of these organizations maintain general secretaries.

Another student organization is The Students' Coöperative Association. This association runs a boarding club and a bookstore. Every thing is handled at a small profit—just enough to pay expenses. The *Students' Herald*, published weekly, has been successfully published by a student organization for more than eight years. It is run entirely by the students, the Printing Department charging only actual expense. The *Herald* ranks high in college journalism. The *Jayhawker*, a monthly magazine, is another student enterprise. This, also, is printed in the Printing Department at cost. Both papers are controlled by stockholders. The stockholders elect the various officers—editor in chief, business manager, local, etc.—each year, and the students favored by such elections have considerable experience both from a literary and business standpoint. The students in printing do the work.

J. D. RICKMAN.

REDUCED RATES TO CALIFORNIA, MARCH 1 TO APRIL 30.—That long-looked-for California opportunity is here at last. March 1 to April 30, the Rock Island System will sell "tourist" tickets to principal points in California at these low rates: \$25 from Missouri River Points: \$25 from Manhattan, Kan. Tickets are good in tourists sleepers, which the Rock Island runs daily, Chicago and Kansas City to Los Angeles and San Francisco by way of El Paso; three times a week via Colorado Springs and Salt Lake City. March and April are the pleasantest months of the California year—doubly so because, at home, they are usually the very opposite. Tickets and berths at all Rock Island ticket offices, or by addressing A. E. Cooper, D. P. A., Topeka, or J. A. Stewart, G. A. P. D., Kansas City.

17-27.

The Faculty is wrestling with a difficult problem—the revision of the courses of study. Meetings have been held every afternoon this week, and the work is not quite completed to day. The amount of classroom work in the different terms will be reduced to fifteen hours per week and that of laboratory or industrial work to ten hours, exclusive of all work in physical training or military science.

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LOCAL NOTES.

Prof. Oscar Erf attended the farmer's dairy convention in Topeka last Tuesday.

Doctor Barnes went to Maple Hill last Saturday to investigate a disease among swine.

Doctor Mayo was called to Vernon on Tuesday to investigate a disease among cattle at that place.

Pres. E. R. Nichols attended a meeting of the State Board of Education, held in Topeka last week.

Mrs. Nichols and Miss Rupp will entertain the Manhattan Domestic Science Club at the home of the former on March 31.

The junior senior girls played a match game of basket ball Monday afternoon. The juniors came out victorious by a close score.

The Veterinary Department of the Experiment Station is building a dipping vat at the College for the purpose of testing the efficiency of various dips for destroying lice and other parasites on animals.

The Marshall County Club had another one of their delightful parties last Saturday night in Kedzie Hall. Twenty-seven sons and daughters from that part of the State were present, and all report a good time. The catalogue for 1903 enumerates fifty names, from seventeen different towns in Marshall county.

Dr. Wm. A. Quayle, of Kansas City, Mo., will give a lecture in College chapel Friday evening, April 8, for the benefit of the Y. W. C. A. piano fund. Tickets will be on sale at the College bookstore and at Doctor Willard's drugstore. Price, 50 and 35 cents. Doctor Quayle was a second-year student here in the early eighties. He has the reputation of being one of the most brilliant platform orators in America.

Manager Mason of the College baseball team, has made arrangements for the following places and dates for the coming spring term: At home—Kansas City Athletic Club, April 2; Bethany College, April 13; Kansas University, April 16; Oklahoma Agricultural College, April 29; Baker University, May 3; College of Emporia, May 21; Ottawa University, May 24. Abroad—Bethany College, March 28; Baker University, May 9; Ottawa University, May 10; College of Emporia, May 11; Nebraska University, May 14.

The building committee of the Board, consisting of Regents McDowell, Berry, and Nichols, met last Monday to consider bids for the construction of the new College waterworks. The contract was awarded to Mr. Geo. E. Hopper, of Arkansas City, a graduate of the College and for several years superintendent of the Manhattan waterworks. The plant will cost ten thousand dollars and is to be completed by July 1. The tower will be built north of the shops and will be one hundred feet high, and the steel tank will have a capacity of one hundred thousand gallons. The capacity of the pump will be six thousand gallons per hour. It will be supplied with power by means of an electric motor connected with the one hundred horse-power dynamo in the power plant. The consumption of water by the College is about twenty-five thousand gallons per day. The well will be sunk just north of the main entrance and will be covered by a neat little stone pump-house.

A good roads convention will be held in the city of Topeka commencing at 10 o'clock A. M., Tuesday, March 29, in the Commercial Club rooms. The meeting is called at the request of the National Good Roads Association. Every city, town, township and road district is entitled to send delegates. W. H. Moore, president of the National Good Roads Association, will address the convention. The following persons, who have taken an active part in this movement, have been invited to be present: W. S. Jennings, governor of Florida; W. K. Vanderbilt, Jr., of New York, and W. J. Richardson, secretary of the National Good Roads Association, and others. At this convention there will be elected delegates to the national and international good roads convention to be held in St. Louis, May 16 to 21, 1904, in conjunction with the Louisiana Purchase Exposition. It is expected that the railroads entering Topeka will give a one-fare rate for the round trip. Those who will attend are requested to notify T. J. Anderson, secretary Commercial Club, Topeka, Kan.

The stock-judging contest held last Monday in the arena of the College barn was highly interesting for the visitors as well as the contestants. The following is a report of the prizes awarded, the first prizes being gold medals and the second ones silver medals: Seniors—N. L. Towne, first prize; L. V. Sanford, second. Juniors—W. W. Stanfield, first prize; F. L. Courter, second. Sophomores—M. R. Shuler, first prize; G. E. Greenough, second. Freshmen—H. A. Ireland, first prize; H. A. Craeger, second. First-year short-course students—W. A. Seng, first prize; W. A. Cooney, second. Second-year dairy short-course and special students—F. L. Williams, first prize; G. E. Ford, second. H. A. Ireland carried off the prize for being the best stock-judging student in the contest. By classes the prizes were won as follows: Seniors first, sophomores second, first-year short course students third, second year dairy short-course and special students fourth, juniors fifth, and freshmen sixth. The cost of the prizes was about \$100, which was contributed by the merchants and business men of Manhattan. The following is a list of contributors, together with the amounts

subscribed: E. L. Knostman, Purcell Trading Company, E. L. Askren, First National Bank, Chas. B. Harrison, Union National Bank, Jno. L. Coons, W. S. Elliot, Eakin & Eakin, H. Wolf, Manhattan Laundry, L. R. Brady, Bohgren & Holt, A. N. Blackman, Dr. Orr, Manhattan Mills, Chicago Lumber & Coal Company, each \$3.00. J. Q. A. Sheldon, R. G. Gillett, Baltimore Hotel, C. G. Anderson, H. T. Crawford, Stingley & Company, Geo. T. Fielding, E. R. Nichols, each \$2.00. Zeigler \$1.50. H. S. Willard, Republic, Varney, Nationalist, A. J. Whitford, Ike Holbert, Allingham & Son, A. H. Faley, R. J. Kinzer, N. S. Cloud, Candy Kitchen, A. E. Souders, Dr. Crise, W. S. Tobey, C. Haulenbeck, Jr., Pfuetze Brothers, Pete Hostrup, O. Erf, each \$1.00. C. P. Blachly, Smith, each 50 cents.

ALUMNI AND FORMER STUDENTS.

Clara V. Newell, '96, is keeping house for her brothers on a farm near Glenville, Neb.

E. P. Smith, '95, and Mabel Cotton-Smith, '96, who are now living at Globe, Arizona, announce the birth of another daughter.

Geo. W. Wildin, '92, whose energy and capacity as a student will be remembered by many, has not kept his alma mater informed to any great extent concerning his progress since leaving here. From occasional news received through others, and from the following taken from *Railway and Locomotive Engineering*, it would seem that Mr. Wildin has been too busy doing things to take any time to talk about himself: "Mr. George W. Wildin has resigned as mechanical engineer of the Central railroad of New Jersey to accept the position of assistant mechanical superintendent of the Erie railroad with headquarters at Meadville, Pa. Mr. Wildin, who is a technical graduate, entered railway service in July, 1892. He served in the following positions on several of our leading roads. On the A. T. & S. F. he held the position of draughtsman and machinist at Topeka, Kan., and machinist and fireman at Raton, N. M. He was locomotive engineer, and assistant in the chief engineer's office, on the Mexican Central; superintendent of machine shop of the Aer Motor Company, Chicago; locomotive engineer on the Chicago & Alton; machinist, locomotive and car inspector and mechanical engineer on the Plant System, and for the past three years he has been mechanical engineer on the Central railroad of New Jersey. He is first vice-president of the Traveling Engineers' Association, a member of the A. S. M. E., of the M. M. and M. C. B. Associations, of the Air Brake Men's Association, of the Franklin Institute, and of the New York Railroad Club. The varied experience which Mr. Wildin gained both in the technical and practical work which he has done is a guarantee of success in the larger field which he now enters. *Railway and Locomotive Engineering* congratulates Mr. Wildin on his promotion and wishes him every success." In which we heartily concur.

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A PRELIMINARY LIST OF KANSAS SPIDERS.

THE following list of one hundred species represents the results of a season's collecting in the central and western parts of the State. It includes also a half dozen species taken in the vicinity of Lawrence by the Department of Entomology of the State University. As the title implies, the list is only preliminary, and the author hopes to double it within the year if opportunity offers for visiting the southern and eastern parts of the State and for more extended collecting in the territory already covered.

The spider fauna of the prairies is not as rich in number of species as the well-watered and timbered regions of the East, but individuals are abundant in several of the more prominent families, particularly the *Lycosidæ*, *Salticidæ*, and *Thomisidæ*. In number of individuals the first-named family undoubtedly leads all the others, the open grassy plains being especially suited to the habits of these roving ground spiders. Second in point of abundance comes either the crab spiders (*Thomisidæ*) or the jumping spiders (*Salticidæ*), perhaps the former. The great variety of prairie flowers blooming in early summer and teeming with insect life afford the proper environment for the lurking habits of the one family or the stalking habits of the other. Then, too, the prevalence of these two types, as well as the abundance of the ground spiders, is no doubt directly related to the fact that they do not build webs—frail structures which would not stand long before the wild, free sweep of our prairie winds. Although the orb weavers (*Argiopidæ*) exceed any one of the three families mentioned in number of species, the individuals are fewer and mostly confined to sheltered localities, the smaller *Tetragnathæ* alone braving any sort of situation.

In all, the list of one hundred species includes representatives of thirteen families and fifty genera. Twelve families accredited

to temperate North America by Simon are not represented, but these families have very scant representation anywhere, and taken together include probably not more than a score or two of species on the continent.

Family AVICULARIIDÆ.

Eurypelma hentzi, Girard.

Mygale hentzii, Girard. Marcy's Expl. Red Riv. of La., 1852, p. 251.

Not uncommon in the southern part of the State. One specimen from Barber county, December 7.

Family DICTYNIDÆ.

Dictyna foliacea, Hentz.

Theridion foliaceum, Hentz. Jour. Bost. Soc. Nat. Hist., VI, 1850, p. 277.

Several specimens from Wild Cat creek, May 9. Common in the woods during the spring and early summer. Cocoons found in May.

Dictyna volucripes, Keyserling.

Dictyna volucripes, Keyser. Neu. Spin. aus Am., III, 1881, p. 286.

Specimens from Delphos, June 30; Hays, July 11; Waconda, August 25. Very common on bushes and grass in midsummer.

Amaurobius americanus, Emerton.

Titanæca americana, Emerton. Trans. Conn. Acad., VII, 1888, p. 453.

One specimen from Manhattan, March 30, and three from Wallace, July 16.

Family THOMISIDÆ.

Misumena aleatoria, Hentz.

Thomisus aleatorius, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 444.

A half dozen males and females from Manhattan, August 17. Not so common as *M. asperata*.

Misumena asperata, Hentz.

Thomisus asperatus, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 447.

Taken at Manhattan, Hays, Stockton and Wallace. Common on flowers everywhere throughout the summer. The color varies with that of the flower, ranging from whitish to red or yellow.

Synæma parvula, Hentz.

Thomisus parvulus; Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 447.

This species was taken in considerable number at Manhattan, September 25.

Tibellus oblongus, Walck.

Philodromus oblongus, Walck. Ins. Apt., I, 1837-'47, p. 558.

Common on grass in late summer. Specimens collected at Manhattan, September 25.

Philodromus vulgaris, Hentz.

Thomisus vulgaris, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 444.

Plentiful under bark in winter. Specimens taken also on August 28 at Stockton and at Manhattan in September.

Tmarus angulatus, Walck.

Thomisus angulatus, Walck. Ins. Apt., I, 1837-'47, p. 537.

A single immature female from Manhattan, October 3.

Xysticus stomachosus, Keyserling.

Xysticus stomachosus, Keyserling. Die Spin. Am., I, 1880, p. 7.

Two females from Manhattan, April 18.

Xysticus versicolor, Keyserling.

Coriarachne versicolor, Keyser. Die Spin. Am., I, 1880, p. 53.

Two females from Manhattan, May 25.

Xysticus triguttatus, Keyserling.

Xysticus triguttatus, Keyserling. Die Spinn. Amer., I, 1880, p. 12.

Several males collected on Wild Cat creek, June 15.

Xysticus nervosus, Banks.

Xysticus nervosus, Banks. Proc. Philad. Acad., 1892, p. 55.

A number of specimens taken under dead leaves at Manhattan, April 20. Not uncommon on foliage in autumn and under leaves or trash in winter.

Xysticus gulosus, Keyserling.

Xysticus gulosus, Keyserling. Die Spinn. Amer., I, 1880, p. 43.

One specimen, a male, from St. George, September 20.

Xysticus modestus, sp. nov. (Plate I, Fig. 1.)

This is a modest little crab spider, smaller than any of the species ordinarily considered as common.

Female.—Length 4.5mm.; width of cephalothorax 2mm.; width of abdomen 3mm. First and second pairs of legs stout, the tibiae and metatarsi armed with two rows of spines set along the anterior margin. The corresponding joints in the legs of the third and fourth pairs show a few weak spines on the under surface.

The middle area of the cephalothorax is yellow, brightest near the base. In the central longitudinal line is a narrowing streak of brown running back from a point between the posterior median eyes. On either side of this streak is a broader stripe of brown, ending, a short distance in front of the posterior margin, in an enlarged portion curved slightly outward. Still farther out, conforming to the outward curve of the cephalothorax, is a broad stripe of brown bordered laterally by a narrow line of yellow. On the extreme lateral margin is a hair line of brown.

The ground color of the abdomen is dark brown. There is a

narrow central stripe of dirty yellow and three broad transverse bands of about the same color. The portion of the dorsal region not occupied by these bands is punctate with yellow. The legs are yellowish brown, the former color predominating on the proximal joints, the latter on the tibiæ, metatarsi, and tarsi. The third and fourth pairs of legs are lighter in general than the first and second pairs. Scattered over the abdomen and also on the front of the head and on the pedipalps are numerous stubby hairs, some of them enlarged at the end so as to be almost clavate.

This spider is a pronounced type, but not common. Several females were taken under rocks in June. In this situation they were guarding their egg sacks.

Family CLUBIONIDÆ.

Anyphaena rubra, Emerton.

Anyphaena rubra, Emerton. Trans. Conn. Acad., VIII, 1892, p. 22.

Female from Manhattan, April 20. Immature specimens rather common in early autumn.

Corinna ornata, Hentz.

Herpyllus ornatus, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 456.

A number of specimens taken on limestone hills near Manhattan, July 4. A species with bright colors.

Castaneira bivittata, Keyserling.

Castaneira bivittata, Keys. Ver. d. bot. zool. Ges. Wien, 1887, p. 442.

One female from Manhattan, July 6.

Castaneira pinnata, Emerton.

Geotrecha pinnata, Emerton. Trans. Conn. Acad., VIII, 1890, p. 6.

One specimen from Manhattan, September 18.

Micaria aurata, Hentz.

Herpyllus auratus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 459.

A female of this species was collected in Clark county in June.

Family DRASSIDÆ.

Sergiolus variegatus, Hentz.

Herpyllus variegatus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 458.

Two or three females collected under rocks at Manhattan, June 10.

Cesonia bilineata, Hentz.

Herpyllus bilineatus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 456.

A specimen from Delphos, June 30, and a female with cocoon from Manhattan, August 19. Cocoon contained twenty-seven young spiders.

Drassodes neglectus, Keyserling.

Drassodes neglectus, Keys. Ver. d. bot. zool. Ges. Wien, 1887, p. 434.

Common under rocks in spring, the male and female in mating sacks. Specimens from Manhattan, May 8. Females with cocoons June 10.

Herpyllus vasifer, Walck.

Drassus vasifer, Walck. Ins. Apt., II, 1837-'47, p. 620.

Immature spiders of this species fairly common under bark in winter. Mature females from Wallace, September 1, and from Manhattan, September 18.

Family SALTICIDÆ.

Marptusa familiaris, Hentz.

Attus familiaris, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 354.

Half-grown specimens common under bark in winter. Mature forms taken in May.

Phidippus comatus, Peckham.

Phidippus comatus, Peckham. Trans. Wis. Acad., XIII, p. 291.

Two males from Wild Cat creek, June 13.

Phidippus cardinalis, Hentz.

Attus cardinalis, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 200.

Males and females very common in mating sacks at Stockton, August 26, and at Wallace, September 1. The females did not undergo last moult until a week or ten days later.

Phidippus rufus, Hentz.

Attus rufus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 536.

A number of males of this species taken in Clark county in June.

Phidippus ardens, Peckham.

Phidippus ardens, Peckham. Trans. Wis. Acad. Sci., XIII, p. 288.

Two females with cocoons from Wallace, July 17.

Phidippus obscurus, Peckham.

Phidippus obscurus, Peckham. Trans. Wis. Acad. Sci., XIII, p. 294.

Three specimens from Hays, July 14, and one female with cocoons from Stockton, August 17.

Phidippus ferruginous, sp. nov. (Plate I, Figs. 2, 3.)

This is a large species with two dominant colors—black and reddish brown.

Female.—Length 14-15mm. Length of abdomen 10mm.; width of abdomen 7mm.; height of abdomen 6mm. Width of cephalothorax 4mm.; height of cephalothorax 4mm.

Legs.—Relative length 4, 1, 2, 3. Absolute length 9.5, 9, 8.5, 10.5 mm., respectively.

Colors.—The abdomen is black beneath and on the sides, with sometimes faint indications of lighter spots or streaks. Above it

is reddish brown except in the central longitudinal region, which is occupied by a black stripe extending from the anterior pair of muscle depressions to the spinnerets. This stripe broadens just back of the posterior muscle depressions until it is nearly 3mm. in width, when it narrows again gradually toward the tip of the abdomen. In some specimens the red projects into the stripe so as to form two pairs of spots. Often these spots are entirely isolated from the red of the dorsum. Occasionally a spider has scarcely any indication of the stripe, being of a uniform reddish brown color above. Usually a lighter red or yellowish streak extends along the front border of the abdomen and runs diagonally down the sides. Back of the diagonal portion of this stripe may be one or two more yellowish stripes running down from the red-brown of the dorsum.

The cephalothorax is black beneath, on the sides, and on that portion of the dorsal aspect that slopes toward the abdomen. The higher portion is reddish brown above, like the abdomen. The chelicerae are iridescent green and purplish. The pedipalps and the first two pairs of legs have yellowish scales scattered here and there, and rings of like color near some of the joints. The presence of some long whitish hairs on these appendages is also common. The second and third pairs of legs are almost always uniformly black, though some specimens have the proximal half of the tarsus lighter.

This spider spends the winter under loose stones in large oval dwelling sacks of closely woven silk, protected in some cases by the addition of leaves or trash. I have found the species only on the summits or higher slopes of hills capped with the Permian limestone. I have not been able to identify the male.

Phidippus morsitans, Walck.

Attus morsitans, Walck. Ins. Apt., I, 1837-'47, p. 432.

Our commonest representative of the family. Specimens from various parts of the State. The species passes the winter half grown. Mature males first taken April 20; mature females May 8.

Hycia pikei, Peckham.

Hycia pikei, Peckham. Trans. Wis. Acad., VII, 1888, p. 79.

Two mature females taken at Manhattan, June 12. A few young collected in sweeping during October.

Saitis pulex, Hentz.

Attus pulex, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 361.

A number of specimens taken in sweeping, June 13. Fairly common for a few weeks.

PLATE I.

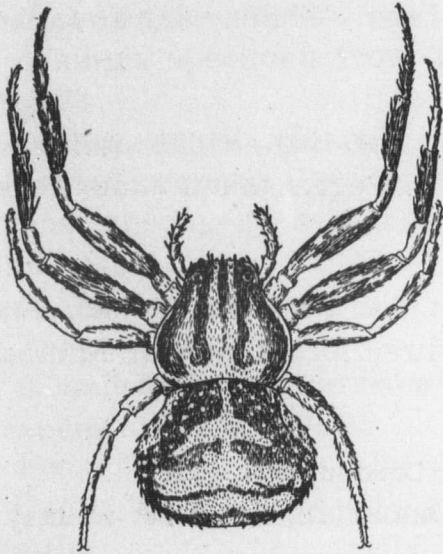


Fig. 1

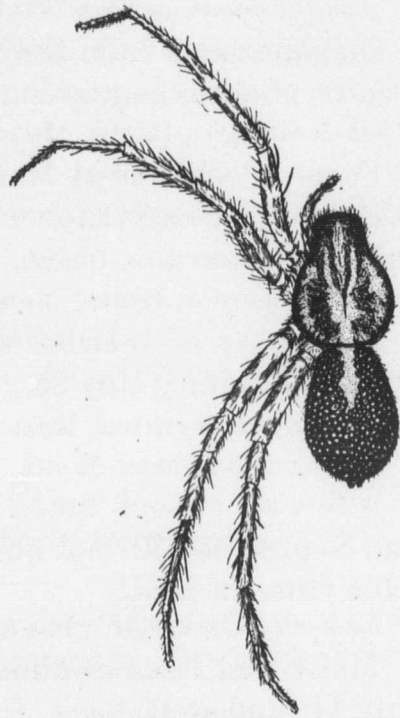


Fig. 7

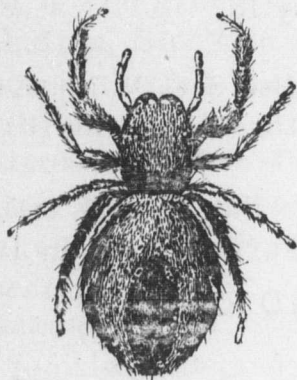


Fig. 2



Fig. 3

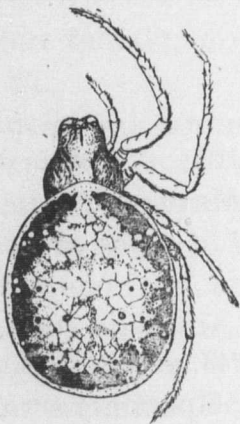


Fig. 4



Fig. 6



Fig. 5

Ballus immaculatus, Peckham.

Attus albo-immaculatus, Peck. Desc. new Att. of U. S. 1883, p. 5.

One specimen from Delphos, June 30.

Dendryphantes capitatus, Hentz.

Attus capitatus, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 200.

Females common at Manhattan in June. Males very abundant in September and October.

Phlegra leopardus, Hentz.

Attus leopardus, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 359.

A number of females with cocoons of eggs taken under rocks near Manhattan, May 25.

Synemosyna formica, Hentz.

Synemosyna formica, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 368.

A few specimens taken in two or three localities near Manhattan, September 30; not quite mature.

Icius vitis, Cockerell.

Icius vitis, Cockerell. The Entomologist, London, 1894, p. 207.

Males and females abundant at Manhattan, June 13; at Hays, July 14; and at Wallace, July 18.

Philaeus chrysis, Walck.

Attus chrysis, Walck. Ins. Apt., I, 1837, p. 454.

One specimen from Manhattan, July 13.

Pellenes elegans, Peckham.

Pellenes elegans, Peck. Bull. Wis. Nat. Hist. Soc., V, No. 4, 1900, p. 212.

One male from Clark county, June 15.

Thiodina puerpera, Hentz.

Attus puerperus, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 360.

One specimen, a male, taken on Wakarusa Creek in June.

Family PHOLCIDÆ.

Psilochorus cornutus, Keyserling.

Pholcus cornutus, Keys. Ver. d. zool. botan. Ges. Wien., 1887, p. 457.

Specimens from Manhattan, April 13; Delphos, June 30; Hays and Wallace, July 14-15. The females taken at Delphos were carrying balls of eggs in their chelicerae.

Family ARGIOPIDÆ.

Linyphia communis, Hentz.

Linyphia communis, Hentz. Jour. Bost. Soc. Nat. Hist., VI, 1850, p. 28.

Very common, as the specific name implies. Mature specimens about Manhattan in May and June. Bushes full of webs of young in autumn.

Linyphia marginata, Koch.

Linyphia marginata, Koch. Die Arach., XII, 1836-'48, p. 118.

About as common as the preceding species. Specimens taken from April 6 to November 1.

Linyphia phrygiana, Koch.

Linyphia phrygiana, Koch. Die Arach., III, 1836-'48, p. 83.

Rarely taken. One specimen from Wild Cat creek, March 9, and a few more from the same locality in September.

Araneus frondosus, Walck.

Epeira frondosa, Walck. Ins. Apt., II, 1837-'47, p. 65.

A single specimen from the Kaw river bridge at Manhattan, May 23.

Araneus ocellatus, Clerck.

Araneus patagiatus, Clerck. Sv. Spindl., 1757, p. 38.

One specimen, a female; from the Blue river valley near Manhattan.

Araneus sericatus, Clerck.

Araneus scolopetarius, Clerck. Sv. Spindl., 1757, p. 43.

A male and a female from Wild Cat creek, October 19.

Araneus arenatus, Walck.

Epeira arenata, Walck. Ins. Apt., II, 1837-'47, p. 133.

Common in the woods about Manhattan in the midsummer months.

Araneus stellatus, Walck.

Plectana stellata, Walck. Ins. Apt., II, 1837-'47, p. 171.

Common in the grass and low bushes in August. Specimens from Manhattan, Stockton and Wallace. Young taken in sweeping until late in the fall.

Araneus labyrinthicus, Hentz.

Epeira labyrinthica, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 471.

Apparently rare. Two females taken in one locality near Manhattan, August 13.

Araneus pratensis, Hentz.

Epeira pratensis, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 475.

Several females collected from webs on tall grass at Manhattan, October 13.

Araneus conspicellatus, Walck.

Epeira conspicellata, Walck. Ins. Apt., II, 1837-'47, p. 58.

One female, not fully grown, taken near Manhattan, September 21.

Araneus benjamini, Walck.

Araneus benjamini, Walck. Ins. Apt., II, 1837-'47, p. 42.

Our most conspicuous orbweaver. Found in the woods and about houses. Varies considerable in color and size. Mature specimens from several localities in August.

Araneus eustalus, Walck.

Epeira eustala, Walck. Ins. Apt., II, 1837-'47, p. 37.

A common species. Specimens from Hays, Stockton and Manhattan in July and August.

Araneus gibberosus, Hentz.

Epeira gibberosa, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 457.

A considerable number of specimens from Manhattan, August 17, and from Stockton August 28.

Araneus thaddeus, Hentz.

Epeira thaddeus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 473.

Two females collected on Prospect hill, near Manhattan, September 21.

Araneus pegnia, Walckenaer.

Araneus pegnia, Walck. Ins. Apt., II, 1837-47, p. 80.

But a single specimen, female, collected near Lawrence in July.

Araneus trivittatus, Keyserling.

Epeira trivittata, Keys. Besch. n. Orbit., Sitz. d. Isis in Dresden, p. 95.

Fairly common in the eastern part of the State. Mature females taken at Lawrence in June and September.

Araneus signaformis, sp. nov. (Plate I, Figs. 4, 5, 6.)

This small orbweaver is of the type usually referred to the genus *Singa*, a group whose species Simon includes in the genus *Araneus*.

Female.—Length 4-5mm. The abdomen is oval, moderately high, and symmetrical in outline. It projects some distance over the cephalothorax. The latter is broad back of the head region, which is much narrower and distinctly set off by lateral grooves. The head itself is considerably elevated. The median ocular area is nearly or quite square. The lateral eyes are contiguous. The legs are short and show very few spines.

Coloration.—The cephalothorax, legs and chelicerae are various shades of dull yellow. The head is usually brightest and the thoracic region darkest, in some cases tinged with brown. The legs are unmarked except in an occasional specimen which shows traces of longitudinal stripes, particularly on the femora. The ocular quadrangle, as well as a small area about the lateral eyes, is black. The abdomen above and on the sides is whitish tinged with a fine network of brown. The muscle depressions are marked by brownish spots, and down the center of the abdomen in most specimens is a more or less branched scar-like stripe. A broad border of black nearly or quite encircles the dorsum near the margin. Sometimes it is interrupted at the anterior end and occasionally also at the posterior end. The central portion of the abdomen beneath is occupied by a broad black band running back from the epigynum and enclosing the spinnerets. On either side

of this is a narrow stripe of white and between this stripe and the margin another band of black. The sternum is also black. These black areas, above and below, are more or less dotted over with light spots.

I have taken but one specimen of this spider in sweeping, but secured over a hundred mature females from the provision stores of some of the mud-dauber wasps in Wallace county.

Argiope aurantia, Lucas.

Argiope aurantia, Lucas. Anls. Ent. Soc. France, 1833, p. 480.

The Golden Garden Spider is pretty well distributed over the localities in which I have collected. Specimens from Manhattan, August 17, and from Wallace, September 1.

Argiope trifasciata, Forsk.

Argiope trifasciata, Forsk. Descrip. Animal., 1775, p. 86.

Less frequently met with than *A. aurantia*. One mature female from Manhattan, October 3. Undergrown specimens from Stockton, August 28, and from Wallace, September 21.

Argyropeira hortorum, Hentz.

Epeira hortorum, Hentz. Journ. Bost. Soc. Nat. Hist., V, 1845, p. 477.

Not uncommon in the scrubby timber. Specimens collected at Manhattan, July 4, and at Stockton, August 28.

Tetragnatha extensa, Linn.

Aranea extensa, Linn. Syst. Nat. etc., Ed. XI, 1758-'67, p. 621.

Abundant in timber and on the prairies, especially in the spring and early summer. Specimens from various parts of the State.

Tetragnatha elongata, Walck.

Tetragnath elongata, Walck. Tabl. d' Aran., 1805, p. 69.

Taken frequently along the streams. Spiders of this species from Manhattan, August 14, and from Stockton, August 28.

Micrathena gracilis, Walck.

Plectana gracile, Walck. Ins. Apt., II, 1837-'47, p. 193.

Common in the woods at Manhattan and St. George in July and August. Not taken farther west.

Micrathena rediviana, Walck.

Plectana rediviana, Walck. Ins. Apt., II, 1837-'47, p. 201.

Only three specimens taken during the season; two at Manhattan, August 17, and one at St. George, October 6.

Micrathena sagittata, Walckenaer.

Plectana sagittata, Walck. Ins. Apt., II, 1837-'47, p. 174.

One specimen, a male, taken at Lawrence in June.

Cyclosa conica, Pallas.

Aranea conica, Pallas. Spicilegia zool., I, 1772, p. 48.

Three specimens from Manhattan, August 13.

Larinia directa, Hentz.

Epeira directa, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 478.

Webs of this species are frequently encountered in the tall grass during the late summer and early autumn. A few specimens from Stockton, August 28; a large number from Manhattan, October 1.

Family LYCOSIDÆ.

Lycosa ocreata, Hentz.

Lycosa ocreata, Hentz. Jour. Bost. Soc. Nat. Hist., IV, 1842, p. 391.

A number of males collected along the small streams near Manhattan in May.

Lycosa polita, Emerton.

Lycosa polita, Emerton. Trans. Conn. Acad., VI, 1885, p. 484.

Only one specimen, a female, from Delphos, May 26.

Lycosa nidicola, Emerton.

Lycosa nidicola, Emerton. Trans. Conn. Acad., VI, 1885, p. 482.

One of our common burrowing spiders. Both sexes taken in considerable numbers at Manhattan in May and at Delphos in July and August. Females observed with cocoons in May.

Lycosa kochii, Keyserling.

Tarentula kochii, Keys. Ver. d. zool. botan. Ges. Wien., 1877, p. 636.

Taken frequently in the region about Manhattan, especially in the fall and spring. Females carrying cocoons as early as April 6.

Lycosa scutulata, Hentz.

Lycosa scutulata, Hentz. Jour. Bost. Soc. Nat. Hist., IV, 1842, p. 390.

Specimens from Hays, July 11; Wallace, July 18, and Manhattan, August 12. Matures in midsummer. Not common.

Lycosa carolinensis, Walck.

Lycosa carolinensis, Walck. Ins. Apt., I, 1837-'47, p. 285.

Taken in various parts of the State the year round. It has burrowing habits very similar to those of *L. nidicola* and *L. fatifera*. Females with cocoons in May.

Lycosa communis, Emerton.

Lycosa communis, Emerton. Trans. Conn. Acad., VI, 1885, p. 489.

Matures in June. Common in all parts of the State visited. The "horse-shoe curve," a color pattern on the under side of the abdomen, is, in nearly all cases, closed by a transverse bar of black behind the epigynum.

Lycosa cinerea, Fabricius.

Araneus cinereus, Fabricius. Ent. Syst., II, 1793, p. 423.

Specimens of both sexes taken on the sandy margins of creeks in Wallace county.

Lycosa pratensis, Emerton.

Lycosa pratensis, Emerton. Trans. Conn. Acad., VI, 1885, p. 483.

Taken occasionally in the fall and spring about Manhattan.

***Lycosa fatifera*, Hentz.**

Lycosa fatifera, Hentz. Jour. Bost. Soc. Nat. Hist., IV, 1842, p. 229.

Specimens taken from burrows at Delphos, June 30. Not so common as the other two burrowing species, *L. carolinensis* and *L. nidicola*. This is undoubtedly the same species as Bank's *L. missouriensis*.

***Lycosa coloradensis*, Banks.**

Lycosa coloradensis, Banks. Jour. N. Y. Ento. Soc., II, 1894, p. 50.

One specimen from Dodge City, September 10, and one from Wakeeney, November 1.

***Lycosa wacondana*, sp. nov. (Plate I, fig. 7.)**

A small species, found about springs or creeks on the prairies.

Female.—Length 7-8mm.; width of cephalothorax 3mm. The abdomen is slightly longer than the cephalothorax, which is narrow in front and widens rapidly back of the head, the thoracic region proper being as broad as it is long. The posterior margin of the cephalothorax is very noticeably procurved above the peduncle.

The legs are rather long and slender. The fourth pair is longest, measuring about 13mm. The front pair measures 10mm. They are sparsely covered with fine dark hairs and beset with black spines.

The ground color of the legs is dull yellow, but they are darker towards the ends, and some of the joints, particularly the femora, are banded near the middle and at their extremities by the darker shade. The coxæ are lighter above and below than the general ground color of the legs. At the proximal end of the trochanters, anteriorly, is a slight roughened prominence or two, much darker in color. The brownish cephalothorax presents a dull yellow middle stripe, widest back of the eyes, and two somewhat undulating lateral stripes of the same color. The dorsal groove is marked by a fine dark line. From its anterior end a forked stripe of brown runs forward to the eyes. In the brown area between the central and lateral stripes of the cephalothorax are several darker streaks arranged radially from the dorsal groove. The ground color of the abdomen is a darker brown than that of the cephalothorax. It is finely punctate with dull yellow. On the front half is a pointed yellow stripe running back to the region of the muscle depressions, and there are faint indications of transverse streaks on the hinder half. The sternum is light in the middle and darker around the edges. The under side

of the abdomen is similarly colored, except that in the central line of the lighter area is a darker streak running from the epigynum to the spinnerets.

I do not know the male of this species. Have taken the female in June about Manhattan, and in August at Waconda Springs. On the latter occasion nearly all the females were carrying cocoons of eggs.

***Pardosa nigropalpis*, Emerton.**

Pardosa nigropalpis, Emerton. Trans. Conn. Acad., VI, 1885, p. 497.

Females carrying cocoons taken at Manhattan, September 26.

***Pardosa lapidicina*, Emerton.**

Pardosa lapidicina, Emerton. Trans. Conn. Acad., VI, 1885, p. 494.

Very common in all parts of the State visited. Specimens carrying cocoons taken as early as April.

***Pardosa sternalis*, Thorell.**

Lycosa sternalis, Thor. Bull. U. S. Geol. Surv. Terr., III, No. 2, 1877, p. 504

Two specimens taken at Wallace, July 16.

***Pardosa albopatella*, Emerton.**

Pardosa albopatella, Emerton. Trans. Conn. Acad., VI, 1885, p. 497.

One male taken at Lawrence in May.

Family OXYOPIDÆ.

***Oxyopes salticus*, Hentz.**

Oxyopes salticus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 196.

Specimens from Manhattan, Waconda and Stockton in August.

Family AGELENIDÆ.

***Tegenaria domestica*, Clerck.**

Araneus domesticus, Clerck. Sv. Spindl., 1757, p. 76.

Common in basements and cellars.

***Coras medicinalis*, Hentz.**

Tegenaria medicinalis, Hentz. Jour. Acad. Nat. Sci. Philad., II, p. 53.

Common. Mature specimens taken under rocks or trash in the winter and spring. Cocoons observed in webs, May 4.

***Agelena nævia*, Walck.**

Agelena nævia, Walck. Ins. Apt., II, 1837-'47, p. 24.

Abundant over the State. Mature males and females first taken August 13.

Family THERIDIDÆ.

***Steatoda borealis*, Hentz.**

Steatoda borealis, Hentz. Jour. Bost. Soc. Nat. Hist., VI, 1850, p. 274.

Common about Manhattan. Females in webs with cocoons, May 9.

Teutana triangulosa, Walck.

Teutana triangulosa, Walck. Faune Paris, II, p. 207.

This species observed only in the basement of buildings on the State Agricultural College grounds.

Theridion tepidariorum, Koch.

Theridium tepidariorum, Koch. Die Arach., 1836-'48, VIII, p. 75.

A common cobweb weaver in all parts of the State.

Theridion murarium, Emerton.

Theridium murarium, Emerton. Trans. Conn. Acad., VI, 1882, p. 11.

A male and a female from Wild Cat creek, June 15.

Latrodectus mactans, Fabricius.

Latrodectus mactans, Fabricius. Entom. Syst., II, 1775, p. 410.

One female from Hays, July 12, two from Wallace, September 1, and one from Manhattan, September 20. Cocoons in webs in each case.

Family PISAURIDÆ.

Dolomedes rufus, De Geer.

Aranea rufa, De Geer. Hist. Insect., 1776, vol. VII, p. 319.

A number of specimens from Manhattan and Delphos during the spring and summer. Also taken under bark in the winter. Nests containing cocoons observed in June.

Dolomedes sexpunctatus, Hentz.

Dolomedes sexpunctatus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 191.

Young spiders of this species from the glacial swamps about St. George, October 15.

Pisaurina mira, Walck.

Dolomedes mira, Walck. Ins. Apt., I, 1837-'47, p. 357.

Undergrown specimens from Wild Cat creek, September 26.

SUMMARY OF GENERA AND SPECIES.

Family Aviculariidae.		Family Clubionidae (Continued).	
Eurypelma	1	Castaneira	2
Family Dictynidae.		Micaria	1
Dictyna	2	Family Drassidae.	
Amaurobius	1	Sergiolus	1
Family Thomisidae.		Cesonia	1
Misumena	2	Drassodes	1
Synæma	1	Herpyllus	1
Tibellus	1	Family Salticidae.	
Philodromus	1	Marptusa	1
Tmarus	1	Phidippus	7
Xysticus	6	Hycitia	1
Family Clubionidae.		Saitis	1
Anyphaena	1	Ballus	1
Corinna	1	Dendryphantes	1
		Phlegra	1

Family Salticidæ (Continued).		Family Oxyopidæ.	
Synemosyna	1	Oxyopes	1
Icius	1	Family Agelenidæ.	
Philæus	1	Tegenaria	1
Pellenes	1	Coras	1
Thiodina	1	Agelena	1
Family Pholcidæ.		Family Theridiidæ.	
Psilochorus	1	Steatoda	1
Family Argiopidæ.		Teutana	1
Linyphia	3	Theridion	2
Araneus	15	Latrodectus	1
Argiope	2	Family Pisauridæ.	
Argyropeira	1	Dolomedes	2
Tetragnatha	2	Pisaurina	1
Micrathena	3	Total number of species . .	
Cyclosa	1	Total number of genera . .	
Larinia	1		
Family Lycosidæ.			
Lycosa	12		
Pardosa	4		

EXPLANATION OF PLATE I.

- Fig. 1. *Xysticus modestus*, dorsal view of female.
 Fig. 2. *Phidippus ferruginous*, dorsal view of female.
 Fig. 3. *Phidippus ferruginous*, side view.
 Fig. 4. *Araneus singaformis*, dorsal view of female.
 Fig. 5. *Araneus singaformis*, ventral view.
 Fig. 6. *Araneus singaformis*, epigynum.
 Fig. 7. *Lycosa wacondana*, dorsal view of female.

THEO. H. SCHEFFER.

REDUCED RATES TO CALIFORNIA, MARCH 1 TO APRIL 30.—That long-looked-for California opportunity is here at last. March 1 to April 30, the Rock Island System will sell "tourist" tickets to principal points in California at these low rates: \$25 from Missouri River Points: \$25 from Manhattan, Kan. Tickets are good in tourists sleepers, which the Rock Island runs daily, Chicago and Kansas City to Los Angeles and San Francisco by way of El Paso; three times a week via Colorado Springs and Salt Lake City. March and April are the pleasantest months of the California year—doubly so because, at home, they are usually the very opposite. Tickets and berths at all Rock Island ticket offices, or by addressing A. E. Cooper, D. P. A., Topeka, or J. A. Stewart, G. A. P. D., Kansas City.

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LOCAL NOTES.

The Y. W. C. A. girls have received their new piano.

Prof. A. M. Ten Eyck has ten articles on agricultural subjects in the last number of the *Kansas Farmer*.

Forty-two tickets were sold at the Manhattan Union Pacific depot, for the Lindsborg excursion and "Messiah" concert.

Prof. W. A. McKeever has an article on "Error in Education" in the March number of the *Teachers' World*, published at Danville, N. Y.

The Library Association received \$83.10 from the Nathan Hale entertainment, which they appreciate very much. They wish to thank Mr. Robert Scott and his co-workers for the above amount.—*Nationalist*.

The new foreman of the blacksmith shop, W. F. Marx, of Madison, Wis., has arrived and reported for duty. Mr. Marx has held a similar position in the State University of Wisconsin, and comes to us well recommended.

The Agricultural College boys opened their baseball season with a winning game Monday at Lindsborg, when they defeated the "Swedes" by a score of nine to six. A good, clean game was played, with no wrangling, and the best of spirit reigned between the teams.

Doctor Quayle, of Kansas City, Mo., will give a lecture in the College chapel, Friday evening, April 8, for the benefit of the Y. W. C. A. piano fund. Doctor Quayle is a popular and literary lecturer. Tickets will be on sale at the College bookstore, and at Doctor Willard's drug store. Prices, 35 and 50 cents.

The College addition of Manhattan was shocked last Wednesday by the report of the death of the father of one of our students. E. W. Holland, aged seventy years, took his own life by shooting himself, at 11 o'clock, at his home in the Failyer cottage, near the corner of Seventh and Osage streets. His health had been very poor for many years, and of late he had suffered untold pain. It is thought that his mind had become deranged. He left a brief note of farewell to his daughter, Miss Holland, who is a freshman student at the College. She was at the College when the deed was committed. She had been caring for her father for several years, and did all in her power to comfort him in the time of his sickness. Mr. Holland moved here from Oklahoma.

ALUMNI AND FORMER STUDENTS.

Cora Thackrey, '98, and Trena Dahl, '01, have returned to take graduate work in domestic science and chemistry this term.

Dr. Ben. Skinner, '91, after eight years of successful and remunerative practice, is taking a three months' vacation for the purpose of private clinical instruction in Kansas City.

We regret to learn that Elizabeth Agnew, '00, has been obliged to discontinue her course in Teachers' College, New York, and return to her home at Yates Center, Kan., on account of the death of her brother.

Mrs. Joe Thoburn [Miss Conwell, '91], of Guthrie, Okla., is here visiting friends, and will also visit friends in the country where she taught school in former years. Mr. Thoburn is secretary of agriculture of Oklahoma.—*Nationalist*.

B. W. Conrad, '95, of Sabetha, stopped off to visit the College. Mr. Conrad lost several valuable horses last summer by strychnine poisoning, but although the miscreant was not arrested, his evil deeds have not been in evidence recently.

H. V. Forest, '00, has returned to take some graduate work in engineering. Since graduation he has been in the employ of a firm engaged in refrigeration and ice manufacture, and has been stationed at various points in the Southern States. His work seems to have agreed with him, as he appears to be in improved health.

The Kansas City Association of Alumni of the State Agricultural College held its second annual reunion Saturday evening, March 26. An elegant banquet was served at the Midland hotel. The attendance was not as large as last year, there being twenty alumni and former students and five others. The occasion was much enjoyed, most of the time being spent in conversation. At the banquet, informal speeches were made by President Nichols, Benjamin Skinner and J. T. Willard. A permanent organization was effected by the adoption of a constitution and by laws reported by Mr. Rushmore. The officers elected for the ensuing year are: Dr. S. L. Van Blarcom, president; Miss Bertha Bacheller, vice-president; Mr. T. W. Morse, secretary-treasurer. Following is a list of those present: H. C. Rushmore, '79, and Mrs. Rushmore, J. T. Willard, '83, Albert Dietz, '85, Bertha Bacheller, '88, Phil. Creager, '91, S. L. Van Blarcom, '91, Ben Skinner, '91, Clay E. Coburn, '91, and Mrs. Coburn, May Harman, '93, W. E. Smith, '93, T. W. Morse, '95, C. E. Holsinger and Olive Wilson-Holsinger, '95, F. E. Johnson, '99, A. T. Kinsley, '99, Anna Smith-Kinsley, '01, J. H. Oesterhaus, '01, C. M. Morgan, second-year student in 1893, Mrs. Eusebia Mudge-Irish, senior student in 1873, Mrs. Mudge, Mr. Smalley, and President Nichols. The chief burden of correspondence and other arrangements for the reunion was borne by W. E. Smith, secretary of the association. Docotor Coburn, the president of the association, presided during the banquet.

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No. 25

THE PARTS AND PLAN OF AN ORATION.

IN a previous article in the *INDUSTRIALIST* I set forth the general nature of oratory, and briefly discussed the functions of that part of an oration called the Introduction. In that article I mentioned also the other main parts of a composition of the oratorical type, namely: the Proposition or Object; the Discussion, and the Conclusion. In the present paper, I desire to call attention more specifically to these divisions, and also to point out the nature and importance of the Plan.

The Proposition may be explained as that part of a speech in which the subject is narrowed and defined for discussion. It is the expression in language of the fact, thought, truth, or principle that is laid down for treatment in the discourse as a whole. It is the central idea of the speech on which everything turns. It is not necessarily identical with what is called the proposition in logic or mathematics, although it may be the same. It is a larger, a more inclusive term. It is not restricted in form to the declarative sentence, but may be an interrogative, and for the speaker's own use even an imperative. It is the statement of what Professor Genung calls "the working idea of the discourse," and describes as "the whole subject turned in a certain determinate direction." It is the definition in the speech itself of precisely that phase of the general subject which the speaker intends to talk about, to expound, to elaborate, or to establish in the discussion. It may or it may not reveal the attitude that he purposes to observe toward the topic in hand, but it does hold him, and so his nearers, to the consideration of that topic and of that alone.

Although the proposition may be expressed in a single brief sentence or even a phrase of two or three words, its importance, indeed its necessity, to successful oratory, cannot be overestimated. And this, because it is the heart of the speech. The connection is a vital one. Without this feature the address may

have, indeed, a reasonably correct outward form; the proposition breathes into that form the breath of life and makes of it a living soul.

For one thing this element serves to steady and give direction to the thought; to secure the great principle of rhetorical unity. Lacking this principle the discourse is chaos, "without form, and void." The proposition broods over the speech and out of the chaos brings order and light. On his own account the speaker needs this concentrated and definite statement of his central topic. How else shall he secure solidity, depth, harmony, concreteness, and progression for his thinking? He may have "thoughts that wander through eternity;" but that is just the trouble—they never do anything else than "wander." It is the function of the proposition to gather in the speaker's wandering thoughts from the clouds that would otherwise befog his mind, and marshal them, as it were, upon the solid earth.

The statement of his proposition is also of great value to the speaker in the work of invention. The young and inexperienced speech-maker is often led to the choice of broad and general themes, on the supposition that vastness of subject will insure richness of material. Just the reverse is true. He who has thus deceived himself soon finds his inventive powers floundering in the slough of intellectual barrenness. A restricted theme is suggestive, because the mind best works in an intensive rather than in an extensive way. The speaker has a certain amount of intellectual force to expend upon his subject; in proportion as his subject is enlarged, therefore, will the intensity of his thinking be restricted. On the other hand, as he calls in his mind from the oceanic wastes of an extensive subject and directs it to the contemplation of a particular theme, he will find many materials in view that previously escaped his vision, and his use of these materials will be more forceful than it could be were his attention to be dissipated over a wide area. Chain lightning is always more effective than sheet lightning.

But if the proposition is requisite to the definiteness, unity and inventive power of the orator's own thinking, no less essential is it for the satisfaction and guidance of the audience. Hearers do not wish to be trifled with or babied. They instinctively demand very early in the speech a definite knowledge of the particular question, to a discussion of which they are expected to listen.

They begin to ask themselves and perhaps others: "What is the speaker driving at? What particular phase of the general topic does he purpose to discuss?" Suppose, for example, the subject to be "The College Settlement." Will he discuss the whole subject? That is too extensive a theme for a brief speech. What then? Its origin? Its history? Its fundamental purpose? The nature of its work? Its achievements? Its prospects? Its opportunities? A score of themes may thus be deduced from any subject. Suppose the last suggested theme is near the speaker's thought, and finally the idea is formulated as "The College Settlement as a Sphere of Usefulness." But at once the query arises, Usefulness for whom? Everybody? No; naturally for those that have been to college. So we have the whole statement: "The College Settlement as a Sphere of Usefulness for Educated Men." All the particular topics are thus held in solution in the general subject. It is the business of the orator to bring the reagent of his own thinking into contact with his general subject, and from it precipitate a particular topic in the form of a proposition, which not only he but his hearers can measure, and see, and feel. When the proposition is thus revealed, and not till then, are the hearers in a condition of mind to listen with patience and intelligence to the unfolding of the speaker's thought, and to weigh with discrimination and confidence the question as presented to them. By its aid they are saved from vagueness and haziness of impression. After listening to an address thus centered in one definite thought, hearers are never heard expressing doubt as to what the orator has been aiming at. They do not feel that he has been talking about everything in general and nothing in particular. They do not regard the orator as a man who has been "drawing a bow at a venture." On the contrary they realize that the oratorical archery has been directed at the "bull's eye" whether it has pierced that mark or not.

The Discussion may be defined as that part of an oration which contains the development of the thought expressed in the proposition. The proposition is the germ; the discussion is the outgrowth of that germ. It bears a relation to the proposition similar to that which a full-grown tree, loaded with fruit, bears to the seed from which the tree sprung. The proposition is the heart of the speech; the discussion is the body of the speech, through every fibre of which the heart's blood beats to give character and vitality.

When once the proposition is settled upon, then comes the work of so developing this proposition as to give it the desired significance and weight with the hearers. What that development shall be will depend upon the nature of the proposition and the attitude toward it, held and desired on the part of the hearers. The discussion may expound, unfold, amplify, illustrate, exemplify, prove, or in in any other way develop the attitude of the speaker toward the thought contained in essence in the proposition.

It is easy to be seen that the discussion constitutes the bulk of the discourse, and that it lays the heaviest burden upon the inventive powers of the speech-maker. At the outset of his preparation he must solve the problem as to what shall be the method of the discussion. Shall it be mainly illustrative, or argumentative, or hortatory, or a combination of all these? In solving this problem, he must estimate the value of a number of factors: such as the nature of the subject itself, the character of his prospective audience, the demands of the occasion, his own tastes and acquirements. All these elements are prerequisites of a successful discussion. Yet they are only prerequisites; they simply aid the speaker in reaching a conclusion as to his method of procedure. There still remains the task of following out the chosen method to a successful issue in the prepared and spoken address.

Although the discussion is simply the amplification of the thought contained in the proposition, it by no means follows that it is a mere dilution of that thought. Instead it offers opportunities for and, indeed, demands sound and rigid reasoning, compact thought, solid intellectual labor.

Perhaps some one will ask, Why is the discussion necessary? If the proposition contains the essence of the entire thought, why not give it to them and leave the hearers to ruminate over it and amplify it for themselves?

1. In reply to this query, it may be said that for one thing the discussion is necessary because, without it, the hearers will not grasp the true significance of the idea, or its precise limits. They need to have its metes and bounds surveyed for them, so that they may know how much it means and what it does not mean.

2. Again, the discussion enables the speaker to give such bulk to his thought as will compel the hearers to have a just appreciation of its nature and value. By thus dwelling upon it, he allows time

for his hearers to take it in, and gives it body by which they can grasp and hold it.

3. Still further, the discussion affords the speaker opportunity to impart to his thought the desired force—the impetus requisite for the accomplishment of his purpose. His object is to move the will of his hearers. In order to attain this object, he must appeal to their intellect by expounding or demonstrating his thought or by establishing its truth; or he must move their sensibilities by stirring their emotions or quickening their imaginations; or he must do both of these things. In a word, he must present his thought so fully and so attractively as to play upon the whole gamut of their souls in order to move them ultimately to a response that shall be in harmony with his purpose. He can accomplish this purpose only as he has time to give his idea all the qualities that it possesses in his own mind. So only can he make his thought possess and control his hearers as it possesses and controls him.

The Conclusion may be explained as that part of the oration, in which the thoughts, arguments, emotions, appeals, and general significance of the entire discourse, are gathered together and so used with reference to the audience, occasion, and purpose, as to make upon the minds, hearts, and determination of those that hear, a single, definite, profound, and indelible impression. Thus the conclusion is the focus of all that precedes, in which the various rays of effective oratory are centered and where they glow and burn with their greatest intensity.

The conclusion bears to the discussion a relation somewhat similar to that which the proposition bears to the introduction. The proposition is the essence of the introduction. As the introduction centers the attention upon the idea expressed in the proposition, so the conclusion gathers together the various lines of treatment contained in the discussion and fuses them into a harmonious unit in keeping with the spirit and purpose of the whole speech. It is what some of the old preachers called the “application.” It is that part of the discourse in which a burst of splendor smites the hearer and a compelling voice speaks to him, causing him to cry: “What wilt thou have me to do?” and answering the cry.

Such being the function of the conclusion, it is obviously of prime importance to the speech. Indeed, rhetorically, it is the end for which the speech is made. To make this end effective,

therefore, it needs no argument to show that in the sweep of its imagination and the nobleness of its sentiments; in the clearness, energy, and beauty of its language; in appropriateness of delivery; in all the qualities that belong to true eloquence, this part of an oration should be preëminent. Suggestions as to the means of securing these qualities need not now be given. At present I am concerned chiefly in explaining in as simple, clear, and definite a manner as possible the nature and functions of the parts themselves.

THE PLAN.

Having considered the nature and kinds of oratory and the main rhetorical divisions into which an oration is separated, let us now consider the subject of *The Plan*.

What the plan is needs little explanation. The name itself defines it. It is simply the framework on which the oration is built. Its purpose is to give clearness, utility, comprehensiveness, order, symmetry, logical coherence, progress and climax to the work—in a word to help make the speech effective in accomplishing its chosen end.

It would seem as if the importance of the plan would be sufficiently apparent to obviate the necessity of emphasizing its value; yet, as a matter of fact, the inexperienced speaker and writer seems to have an inborn aversion to working from a skeleton. Students almost invariably question at first its advantages and yield reluctantly to its demands. "Why restrict," they ask, "the free operation of the mind? Why shackle the feet of genius or clip its wings?" Adherence to a rigid plan, they claim, hinders invention, robs composition of ease and grace, if not, indeed, of power, and makes the entire work stiff and mechanical.

Although these sentiments are based on mistaken notions, such objections are so prevalent that it is worth while to consider, briefly, some of the reasons for insisting on a plan.

In the first place, it may be said that the objection, so far as it is valid, is a confession on the part of the speaker of a lack of skill in making and using the plan, not an objection to the plan itself. If it makes the speech mechanical, it is because the speaker is not yet a good mechanic. It is no condemnation of a tool to say that it cuts the workman's fingers, although it may be a criticism of the workman's awkwardness. It may mean, simply, that he needs more practice. Ease and grace of style, when writing to a plan, are largely a matter of skillful transition.

For the orator to expect the highest success without a plan is as irrational as it would be for the architect to undertake the building of a cathedral without a plan.

1. A carefully wrought out skeleton is a great help both to the speaker and to the hearer. It aids the speaker in perspicuity of thought and of discussion. Clear mental action of necessity involves orderly mental action. The writer or speaker clarifies his own mind on a subject by putting an outline of his thinking and reading on that subject in definite, exact, logical and climacteric form—his own thoughts are the more lucid for the exercise.

2. Such analysis is also an aid to composition. By giving a concreteness to the treatment, it suggests lines of reasoning and illustration that would altogether elude the mind without such device.

3. Still further, a good plan is a help to the memory. It answers the purpose of a system of mnemonics, one division suggesting another as its supplement or correlative, and each part serving to remind the speaker of the subordinate topics that are marshalled under its leadership.

4. A thorough analysis, also, promotes comprehensiveness of treatment. Instead of hindering, it helps the work of invention. By the classification of materials demanded by his plan, the degree of completeness of his discussion is revealed to the maker of a speech at a glance. Is an argument defective? Is an illustration needed to enforce or vivify a thought? Is some point of the discussion left unguarded? Is an appeal made to wrong motives, or is it not legitimately drawn from the arguments presented? Whatever be the defect in the discussion, a well-ordered plan will reveal the deficiency and suggest measures for remedying it.

5. A careful analysis is necessary, also, in that it promotes unity. As the proposition insures a center of thought, so the plan promotes a development on the basis of that center. He must, indeed, be a crazy thinker, who can, at his leisure, make a plan wander incoherently over the surface of a subject. To classify materials in the plan is to unify those materials in the discussion.

6. Again, a well-ordered plan is a great promoter of progress. It aids the speaker in getting on in his work. At every step, he feels, and his hearers are made to feel, that he is advancing. He is not as some one has said perpetually "marching round the periphery of a treadmill; not a top, spinning on its own axis but

never advancing." He can realize at every division of his plan that so much is done. He has finished that; he is ready to consider this; he is so far along toward the goal.

7. Another advantage of a good plan is that it promotes permanence of impression. If it is a help to the memory of the orator in pronouncing his speech, it is no less a help to the memory of the hearer in retaining that speech. A well-articulated discourse is the one that fixes best the attention and consequently pierces deepest the recollection of an audience. The various divisions of his speech are the nails with which the speaker fastens his leading thoughts into the minds of those that hear. They serve to give weight, dignity, force, velocity, to his thought and style, and so the listeners are more deeply and lastingly moved than could otherwise be the case.

SUMMARY.

Thus, in every way, a thorough outline is an advantage. It promotes clearness, helps in the composition, aids the memory of both speaker and hearer, secures unity of treatment, and gives comprehensiveness to the discussion. In short, it is essential to the success of the speech. It is well named, sometimes, the "skeleton." It may not be, in itself, "a thing of beauty," but it is nevertheless that which gives beauty and flexibility, strength and life to the whole structure. It is the skeleton which enables the speech to struggle and toil, to dance and run.

Now the question arises, to what extent should the plan appear in the finished work. Enough has already been said to suggest the rational answer. The young writer and speaker is ordinarily too fearful of making his production mechanical by announcing the divisions of his discourse. Doubtless this dread is exaggerated. We may set it down as a principle that a discussion which seems to the speaker unnecessarily rigid and formal, will ordinarily impress the hearer as only carefully and helpfully constructed. The former is familiar with the plan and its development; the latter meets the skeleton for the first time in the spoken address, clothed with flesh and blood. Consequently, the hearer is not unduly impressed by the bones of the discourse; he is rather conscious of its symmetry and strength.

We may say that whatever has been found helpful to the speaker, in exploring his way through the discourse, will generally be equally helpful to the listener in following the same track

of thought. Is it not rational to conclude, therefore, that the wise speaker will state, as he proceeds, the main divisions of his plan so clearly that the audience will be keenly alive to the progress he is making and to the corners he turns? Such statements have been well called both mile posts and finger-posts on the way—they show how far the speaker has come and point out the road he intends to follow. Without them, the line of thought, especially if it be at all profound or intricate, may be as obscure as a journey through an African wilderness.

Of course, it is admitted that the degree to which the plan shall be stated in the finished production will depend partly upon the subject and the audience. Some propositions are so familiar, or have been so clearly presented by a previous speaker, and some audiences are so exceptionally intelligent, that there will be no great difficulty in following the speech; but even in such a rare combination of favorable conditions, it will usually be advantageous to have the principal points of discussion announced. Hearers always have a feeling of satisfaction in knowing substantially what is before them.

It will be noticed, also, that emphasis is laid on the importance of stating simply the *main* divisions of the plan in the speech itself. It may be assumed that the orator will use many minor details of outline, in preparing his speech, which he will not point out in the delivery as parts of the skeleton. CLARK M. BRINK.

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ERGOTISM IN CATTLE.

IN traveling over the State in the summer of 1902 the writer observed an unusual amount of ergot on wild rye and wild barley, due, probably, to the moist season, which favored the development of this fungus. As a result of these observations a press bulletin was issued about the middle of September, 1902, warning stockmen of the probable results of feeding hay containing ergot.

Ergot is a parasitic fungus (*Claviceps purpurea*) that develops on the heads of wild rye, redtop, and similar grasses. This fungus replaces the ordinary seed or grain with a black or brown-black grain usually longer than the ordinary rye grain, cylindrical, pointed and slightly curved. The number of grains of ergot in a single head of rye or grass will vary from one to a dozen or more.

The grains of ergot can be easily recognized by their shape and color. There is no dust or smut upon the heads of grain as there is with some fungi. Ergot does not attack corn or sorghum.

When ergot is eaten by animals it contracts the blood-vessels, particularly of the extremities, to such an extent that the circulation may be stopped and the part die. The parts commonly affected are the legs or feet, particularly of the hind legs, and in some cases the tails. It may cause pregnant animals to abort. These symptoms are most pronounced in rather thin animals and during cold weather. The disease is commonly known as ergotism.

Four outbreaks were observed—three in the winter and spring of 1903, and one recently that was caused by feeding hay cut the summer of 1902. All cases observed were in cattle, and I have been unable to learn that any other species of animals were affected though fed on the ergotized hay.

The first outbreak occurred in Clay county. I was requested by Governor Bailey to investigate a reported outbreak of foot-and-mouth disease. A bunch of fifteen head of mixed native cattle was found, eleven of which were suffering from ergotism. Of the eleven affected animals six had lost both hind feet; the hoofs, bones and tissues had sloughed off, most of them at the fetlock or ankle joint, and several of the animals were hobbling about on the ends of the cannon bones that protruded from one to two inches. Some of the remaining five had lost one toe, and in two or three the hoof only came off.

In April, 1903, two outbreaks occurred in Atchison county, not so severe; here, in addition to the injury to the feet, the tails of several animals had sloughed off as the result of ergotism. Recently a herd of over one hundred head of range bulls was examined in Chase county, about thirty of which were suffering from ergotism. These bulls were being fed a large quantity of roughness preparatory to putting them on full feed. The roughness consisted of cane, shock corn, and some two-year-old bottom-land hay. Being range bulls they did not know what corn was and would not eat the ears, picking off the leaves and husks and leaving the husked ear on the stalk. The hay, which was not of good quality, but composed largely of wild rye which was filled with ergot, they ate ravenously, and those bulls that ate the most hay were, as a rule, the most seriously affected.

The affected animals were all in fair flesh. They were first no-

ticed to be stiff in the hind-legs and "weak in the back." The tissues above the hind feet appeared inflamed and swollen, and soon cracks appeared, usually just above the heels, and the hoof and soft tissues began to separate and come off. In some cases there was a "corded" appearance to the leg half way up the cannon bone or in the region of the fetlock as if a cord had been tied tightly about the leg and cut off the circulation. In some cases the dead tissues had sloughed away and in others the soft tissues were dead and dried on to the bones. Some twenty-five or thirty were diseased to such an extent that it was a matter of humanity and economy to destroy the animals.

In some of these outbreaks the owners were of the opinion that the feet of the animals had been frozen, but dry feed lots and warm weather were incompatible with this theory. The presence of ergot in the hay was conclusive evidence as to the real cause of the disease.

N. S. MAYO.

Arbor Day was celebrated at the College by the seniors and freshmen planting class oaks on the campus. The seniors planted theirs in the morning, while the freshmen, to the number of several hundred, faced the rain-storm in the afternoon. Appropriate speeches were made at the latter ceremony by members of the freshman class, and by Professor Walters and Miss Rice as representatives of the Faculty. The speakers expressed the hope that in the years to come there would be many more class trees planted on the campus, and that this particular oak would become a Methuselah and a Samson. It was a patriotic gathering that planted this oak, and one of which the freshmen may well feel proud, though an unmanly wretch removed the tree the very first night.

BULLETIN OF REDUCED RATES.—Travelers of an economical turn of mind will be interested in these low rates. They apply from Manhattan, Kan., to San Francisco, Los Angeles, Portland, Seattle, and Tacoma, \$25, to-day and every day until April 30. Home-seekers' excursions to the West and Southwest, one fare plus \$2 for the round trip, April 5 and 19. California and return, \$45, April 23 to May 1. Full information at all Rock Island ticket offices, or by addressing: A. E. Cooper, D. P. A., Topeka, or J. A. Stewart, General Agent, Kansas City,

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LOCAL NOTES.

Doctor Mayo was called to Anthony last week and to Lyons this week, on State work.

The walls of the new Carnegie library of Manhattan are completed to the water table.

Prof. O. Erf has gone to St. Louis to superintend the installment of the dairy exhibits in the Palace of Agriculture.

Prof. J. D. Walters has been asked to deliver a course of twelve lectures on home architecture before the Colorado Chautauqua Assembly to be held at Boulder next July.

The lecture on "The New Woman and the Old Man," at the College Friday evening, by George Bain, was the last number on the lecture course. It was highly enjoyed by the students.

The cadet band has recently added a new German Silver Bb double bass, a so-called French bombardon, to its equipment. The horn has cost \$130 and comes from the well-known firm of Conn. & Co., Eckhard, Ind.

The Department of Agriculture has lately received from the carpenter-shops two new, large specimen cases for storing seeds and soil samples. The cases have glass fronts. Each is divided into eight divisions capable of holding about four bushels.

The rain and snow-storm last Thursday, Friday and Saturday was one of the most severe that ever swept over this part of the State at such a late date. Fortunately, the temperature did not fall more than eight or ten degrees below freezing, so that probably only little damage was done to fruit-buds and early-planted seeds. The full effects can not be ascertained at this writing. The rainfall and moisture resulting from the melting snow, amounting to over three-fourths of an inch in central Kansas, will put wheat in good condition.

Among the applicants for the position of Kansas bands at the World's Fair is Brown's Military Band, of Manhattan. This is one of the best equipped bands in the State. All of its instruments are of a late model and international pitch. The membership is made up largely of picked men from the College band, located in Manhattan; and in addition, about ten professional soloists. Mr. Brown, the director, was in the city during the last meeting of the commissioners, but nothing definite was decided on at that time.—*Topeka Capital.*

The Veterinary Department received two locoed horses from Liberal, Kan., last Saturday. One was so weak it was unable to stand the shipping and died soon after reaching Manhattan. The other is an interesting and typical specimen of the effects of eating the loco weed.

The Board committee on revision of courses of study, consisting of Regents Fairchild, Friend, and Nichols, met last Saturday and agreed on a schedule based on the one submitted by the Faculty. Their report will be placed before the Board at the next meeting, April 13 to 16.

The *London Field*, in a recent issue, after reviewing Doctor Mayo's book on *The Care of Animals*, says: "We can recommend the book to those who desire a large amount of information compressed into a comparatively small space, given in perfectly plain terms, and being abreast of the present state of our knowledge of the subject of animal disorders. The work has the further merit of containing a considerable number of well-executed illustrations taken from photographs, among which we are glad not to recognize any of our old friends the stereotyped drawings and venerable wood cuts which have done duty from time immemorial."

The digging and arching with brick of the heating tunnels that connect the different College buildings with the central heating plant is nearing its completion—work that was commenced several years ago. It was first thought that it would not be necessary to arch all the parts of the tunnels, but the wet season last spring showed that without arching the pipe lines would be in constant danger. The work has consumed over one hundred fifty thousand vitrified brick and more than one hundred twenty barrels of Cincinnati hydraulic cement. The enlarging of the tunnels to make room for the walls and the arch was done by students, while the masonwork was furnished by Mr. J. Wilkinson, a Manhattan bricklayer. The next step will be to cover the whole pipe system with asbestos felt, a job that will cost more money than the College can afford to devote to this purpose at present. It is hoped that the next legislature will provide for this.

ALUMNI AND FORMER STUDENTS.

C. P. King, '98, is secretary of the King Lumber Company, Chanute, Kan.

Z. L. Bliss, '00, writes from 606 Catherine street, Ann Arbor, Mich. He is studying forestry in the university.

Geo. W. Finley, '96, and Dora Shartel-Finley announce the birth of Winona Vernon Finley, on March 29, 1904, at Tonkawa, Okla.

E. M. S. Curtis, '93, is now rate clerk in the general passenger office of the Southern Railway, Washington, D. C. His address is 1300 Pennsylvania avenue.

C. E. Pincomb, '96, visited the College last Saturday while on his way home from Mexico. He has been spending the winter looking after property interests on the Panuco river on the coast northeast of Mexico City.

C. A. Chandler, '00, is no longer connected with the Missouri Botanical Gardens. He worked all last winter under the chief of landscape gardening for the fair grounds, and is now working on the government building of Germany. He is living at Wellston Station, within fifteen minutes' ride of the grounds.

The Bloomington (Ill.) *Weekly Pantagraph*, in its issue for March 25, contains an extended notice of the work of Miss Myrtle Mather, '02, in the Soldiers' Orphans' Home, at Bloomington. Sixty-one girls from thirteen to sixteen years of age receive instruction in cooking and serving meals. Miss Mather's work seems to be highly satisfactory.

F. W. Ames, '94, now gives as his address Room 519, Carnegie Building, Pittsburg, Pa., where he will be very glad to meet any of his schoolmates and friends who may be passing through Pittsburg. He thinks the College people must dodge that city as much as possible, as during a residence of nearly three years he has not met an alumnus and but two former students.

Harold T. Nielsen, '03, has an article on "Alfalfa, the Greatest of Forage Crops," in the *Farmer and Breeder*. That paper, however, in introducing Mr. Nielsen, credits him to Nebraska University. We feel sure that Mr. Nielsen is not responsible for this, as he is too loyal a son of his Alma Mater. The article is a good one, and we do not like to see the College deprived of the reflected luster to which it is entitled.

Geo. V. Johnson, '91, wishes the INDUSTRIALIST to follow him to his new home at Cedarvale. He writes: "I am still very much interested in the College and the College news. I have run a newspaper in Sedan about eight years, but sold it and have moved onto a four hundred acre farm I own three miles from Cedarvale. There are about three hundred acres in cultivation on my farm, and I will now have a chance to put in practice some of the theories of agriculture I learned while at College."

Dr. William A. Quayle, second-year in 1880, since a graduate of Baker University and president of that institution, who has achieved fame as a preacher and lecturer, delivered his interpretation of the problem of "Hamlet" in the College chapel last evening under the auspices of the Young Women's Christian Association. Doctor Quayle fully sustained his reputation as an orator, and those who failed to hear him missed a rare opportunity. The smallness of the audience which greeted him was due largely to the April blizzard raging, and to the fact that a ladies' minstrel show was being rendered in town. Doctor Quayle regards the play of "Hamlet" as a study of the struggle of a great soul with the problem of evil, "Right," apparently, "forever on the scaffold, Wrong forever on the throne."

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Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.)...	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Mathematics
Miss Gertrude Barnes.....	Assistant Librarian
William Baxter.....	Foreman of Greenhouses
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B. S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Miss Eleanor Harris, B. M. (Chicago College of Music).....	Assistant in Music
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
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Leslie F. Paull, A. M. (Brown University).....	Assistant in Botany
Miss Emma J. Short.....	Assistant in Preparatory Department
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Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Mildred Shaw, A. B. (Washburn).....	Assistant in Mathematics
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
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R. F. Booth, B. S. (Northwestern).....	Assistant in Physics
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Miss Florence H. Vail, B. S. (K. S. A. C.).....	Assistant in Chemistry
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Sumner M. Manley, S. B. (Mass. Inst. Tech.).....	Assistant in Mechanical Engineering
G. A. Menzie.....	Assistant in Dairying
W. F. Marx.....	Foreman of Blacksmithing
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No. 26

SUMMARY OF BULLETIN NO. 123.

THE soil of the Station farm is upland, a light-colored, rather compact loam, inclined to wash, not very fertile and not very uniform. Except for the excessively wet weather in May, which delayed planting, the season was favorable for the growth of crops. During the growing season (March 1 to October 31) 35.68 inches of rain fell. Some two hundred forty acres divided into three hundred sixty separate plots, ranging from one-tenth of an acre to five acres in area, were devoted to the various experiments in crop production last season.

1. No experiments were made with winter wheat. In the trial of spring wheat varieties, the Macaroni type gave the largest yield and heaviest wheat. Ordinary spring wheat was a poor crop.

2. The six-rowed bearded type of barley ranked first in yield and quality of grain. The best yielding varieties were Common barley, 33.9 bushels; Bonanza, 33; and Mandscheuri, 32 bushels per acre. Barley was not injured so badly by hot weather as were oats, and this crop may be grown successfully throughout the larger part of the State.

3. Among twenty varieties of oats tested, the Sixty-Day oats, a new variety recently imported from Russia by the United States Department of Agriculture, gave the largest yield of grain, 53.9 bushels per acre. The three varieties giving the next largest yields were Black Beauty, 52.1 bushels; Kherson, 46.7 bushels; and Red Texas, 43 bushels per acre. The Kherson oats is another Russian variety. The early maturing varieties yielded much better than the late varieties. Early sowing is desirable as well as earliness in maturing, in order that the crop may escape the hot weather which is so apt to blight late oats.

4. Emmer yielded 1756 pounds of grain per acre, which was 44 pounds more than the largest yield of oats and 129 pounds above

the yield of the best producing barley. This new grain is better adapted to growing in a dry climate than oats or barley, and it seems to resist diseases and unfavorable weather conditions better than the other grains. It may not take the place of barley or oats as a feed, and is better fed ground and in combination with other grains.

5. Flax was planted rather late in the season and was a poor crop, the average yield being 6.5 bushels of seed per acre.

6. Millet was a fair crop. German millet ranked first both in the production of hay and seed, while Siberian millet ranked second. The largest yields were 3.6 tons of hay and 25.2 bushels of seed per acre. Japanese Barn-yard millet was a poor crop, while Hog or Broom-corn millet made a total failure of crop. The fox-tail varieties seem to be best adapted for growing at this Station.

7. The varieties of soy-beans yielding more than 13 bushels of seed per acre were as follows: Yellow, Small Yellow, Ito San, Early Yellow, Green Samarow, and Early Brown. The Ito San and Yellow varieties were by far the best yielders. The Early Yellow and Ito San are both very early in maturing and much the same in type and season. The first-named variety is a standard sort in Kansas.

8. Thirty-four varieties of cow-peas were planted in the field trial. The New Era variety gave the largest yield of grain, 11.07 bushels per acre. Only a few of the varieties matured seed, and as a grain producer the soy-beans are to be preferred to cow-peas for growing in this State. Cow-peas make a ranker vine growth and are usually to be preferred to soy-beans for forage production, several of the better producing varieties yielding, on an average, 2.5 tons of dry fodder per acre. The Whip-poor-will cow-peas, a medium early variety, is well known and most extensively grown in this State.

9. Coleman cane yielded 40.5 bushels of seed and 7.41 tons of cane stover per acre. Other good producing varieties were Early Amber, Kansas Orange, and Kavanaugh. The Amber cane matured the earliest, the Kavanaugh was the latest maturing variety. When stacked fifty days after harvesting the cane stover still contained on the average 51.7 per cent of water.

10. Yellow Milo maize and Large African millet gave larger yields of fodder and much smaller yields of grain than the Kafir-corn. There was little difference in the yield of red and white Kafir-

corn. The average yield was 58.2 bushels of seed per acre and 4.25 tons of stover per acre. In the production of grain, Kafir-corn proved much superior to cane. The Kafir stover contained fully as much water when stacked as the cane stover.

11. In the trial of broom-corn varieties the Extra Early Japanese appeared to be superior to the others for the manufacture of brooms, while the Genuine Dwarf ranked second. The first variety named also gave the largest yield of seed, 29.9 bushels per acre.

12. *Pencilaria* gave a total yield of 5.25 tons of fodder per acre. This plant is really the old "cattail" or Pearl millet (*Pennisetum spicatum*), and in the average Kansas soils the sorghums are greatly to be preferred as being a surer crop, more productive, and more valuable for forage.

13. The yield of Teosinte fodder was much less than that secured from sorghum, and as a forage crop in Kansas it is not to be compared to corn, Kafir-corn, or cane.

14. Seventy-nine varieties or strains of corn were grown in the comparative test last season. It is a remarkable fact that in the same field and under the same conditions of culture the yields of "standard" varieties of corn varied from 31 to 89 bushels per acre, which indicates that the adaptation of the different varieties to different soils and climates is a subject worthy of careful study. The varieties giving yields of shelled corn above 74 bushels per acre were: Hildreth (yellow dent), 89.02 bushels; Brazilian Flour, 82.01 bushels; Hammett (white dent), 79.04 bushels; Mammoth White Dent, 77.12 bushels; Griffing's Calico, 76.64 bushels; Klondyke, 75.7 bushels; Cocke Prolific, 75.7 bushels; and Bicker's Choice, 74.53 bushels.

All of these were "native" Kansas-grown seed except Cocke Prolific and Brazilian Flour, the seed of which was southern grown. The five best "native" varieties gave an average yield of 79.5 bushels per acre; the five best imported sorts, 72 bushels per acre. Of the thirty-three varieties yielding over sixty bushels per acre, eighteen were Kansas-grown seed. Nineteen out of the thirty-three were Yellow Dent, ten were White Dent, and three were the Calico type of corn. The best producing "native" varieties are characterized by large stalks, large ears and medium large kernels containing large germs. These characters seem to go with hardiness and productiveness.

The early maturing varieties (northern-grown seed) gave the lowest yields. The late maturing sorts were the best producers of both grain and stover. Sixteen out of the thirty-three best producers were late or medium late varieties (average yield 71.6 bushels of corn and 5084 pounds of stover per acre), while seventeen varieties matured medium early (average yield 65.4 bushels of corn and 3732 pounds of stover per acre). The varieties scoring highest (above 85 per cent) in points other than yield were: Forsythe's Favorite, 88.4 per cent; Griffing's Calico, 87.7 per cent; Nebraska White Prize, 87.1 per cent; Sander's Improved, 85.7 per cent; and Funk's Ninety-day, 85 per cent.

The field in which the trial was made was heavily manured. Several of the varieties grown in an adjacent field which received no manure gave 18 to 25 bushels per acre less yield than was secured in the regular trial. Soil fertility is a very important factor in producing large yields.

15. In a trial of late forage crops sown broadcast June 24, cane yielded 7.7 tons, Kafir-corn 6.12 tons, corn 3.93 tons, and cow-peas 2.04 tons of cured fodder per acre. The fodder cut in September was well cured when stacked in December. Moisture determinations were made from samples of the fodder taken December 25, which gave the following results: Moisture in cane, 39.4 per cent; Kafir-corn, 36.2 per cent; corn, 27.01 per cent. Cane and Kafir-corn sown broadcast are excellent forage crops, giving large yields of fodder of good quality.

16. As late pasture crops (sown broadcast), corn and soy-beans and corn and cow-peas were preferred by the cattle to the sorghums and furnished far more grazing. Much of the cane and Kafir-corn was trampled down and wasted, while soy-beans and cow-peas planted alone were not eaten so well by the stock as when these plants were grown in combination with corn. Soy-beans seemed to be preferred to cow-peas by the cattle, especially in the early part of the season before the soy-beans began to mature.

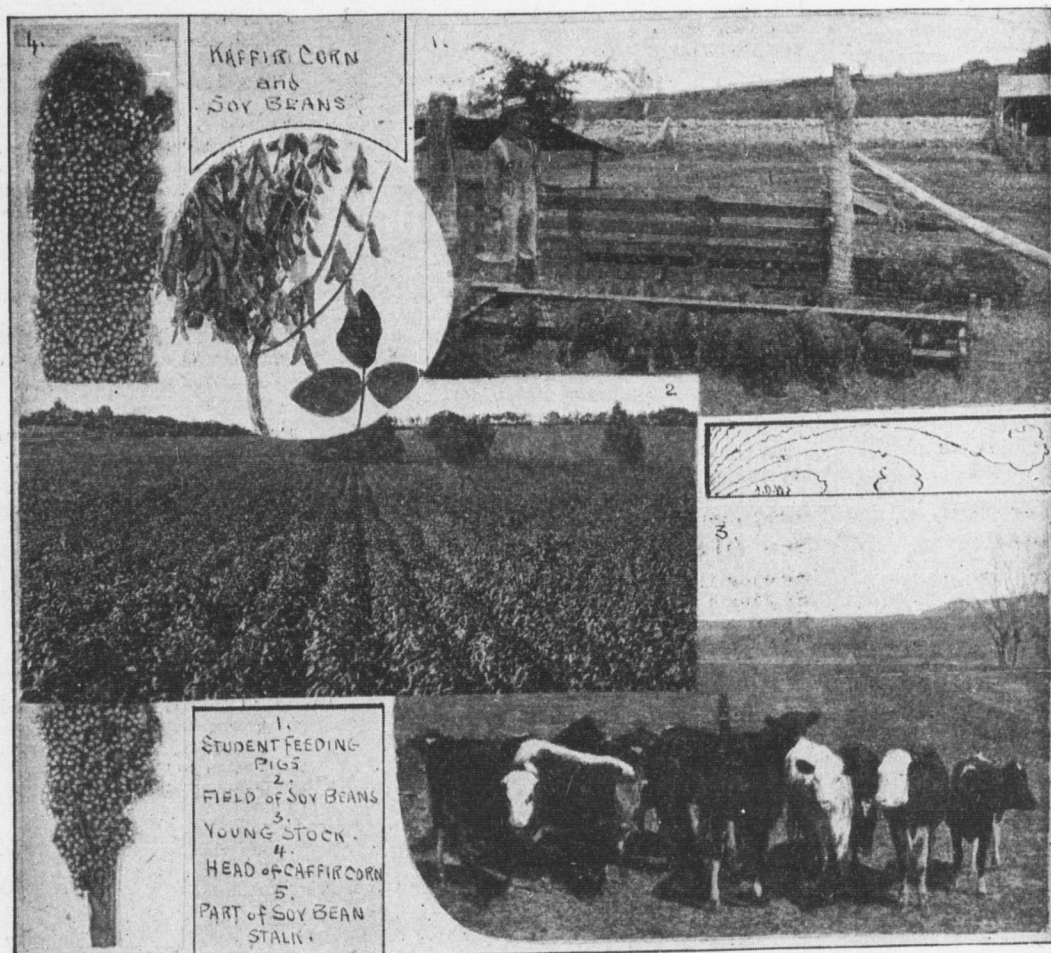
17. As silage crops, alfalfa was put in the silo at less cost per ton than any other crop. Cane and Kafir-corn gave the largest yields of any of the annual crops, and the cost per ton of siloing these crops was less than the cost of siloing the corn. Corn ranked second in yield of silage, and cow-peas third. Corn and cow-peas grown together in drill rows and cultivated made good silage, and this combination will also make excellent dry forage.

18. The experiments in baling alfalfa hay from the field have shown that it is not safe to bale the hay until it is well cured and ready to stack. The alfalfa which was baled in this condition made a good quality of hay, retaining the leaves better than is usually the case when alfalfa is baled from the stack.

19. Two series of rotation experiments have been begun with the object of studying the effect of the different crops on corn and wheat, and vice versa when several crops are grown in rotation, with the ultimate purpose of learning what combination of crops may be grown in succession so as to give an ideal rotation of the several crops. The rotation systems also include methods of green manuring.

20. The Farm Department is making a careful selection of seed of the best producing varieties of the various crops. Those varieties which prove superior to others in points of yield and quality will be propagated in a larger way, with the purpose of distributing the seed among the farmers of the State.

A. M. TENEYCK,
V. M. SHOESMITH.



SPRING TERM PROGRAM, 1904, SHOWING INSTR

INSTRUCTOR.	First Hour.	Second Hour.	Third Hour.	Fourth Hour.
Walters.....	Sp. Arch 5	Sp. Arch..... 2	Descriptive Geometry.....23-10	
Evans.....	Object Drawing.....10	Elementary Projection.....20	Elementary Projection.....6	
Weeks.....	Geometrical Drawing.....20-4		Geometrical Drawing.....8-12	
Brown.....	Singing, Notation, Orchestra, Band.....			
Brown, R. H.....	Band.....			
Harris.....	Piano.....			
Willard ²		{Or. Chem. TTS. 17 {C. Lab. W & F.. 16		
Mathewson.....	{Anal. Chemistry..... {and Laboratory.....	18 15		
McClenahan.....	Al. Chem. & Lab. 16	{C. Met. W & F.. 31 {C. Lab. TTS.... 16	Chem. Met. Laboratory.....14-22	
Vail.....				
Popenoe ²	Sp. Entomology 3		Geology.....36	Entomology... 27
Dean ²	Entomology... 42		Ent. Lab.....42	
Scheffer.....		Zoology.....38		
Remick.....	Int. Calculus.....27	Anal. Geometry 19	Trigonometry...19	Anal. Geom....12
Halstead.....	Trigonometry...27			High. Algebra..26
Shaw.....	Geometry I.....25		Algebra II.....39	Geometry II....24
Fallyer.....	Geometry I.....31	Algebra III....26		
Eyer.....			Elec. Mag.....19	Alt. Cur.....14
Hamilton.....	Physics Laboratory		El. Physics.....14	El. Physics.....16
Anderson.....	El. Physics.....18	El. Physics.....14	Physics Laboratory	
Roberts ²		Plt. Breeding...23	El. Botany.....57	
Paull ²	El. Botany.....54			El. Botany.....45
McKeever.....	German.....12	Psychology....26	Psychology.....28	Meth. & Man...13
McCormick.....		Appl. Mech....10		
Paul.....	Hydraulics.....22	St. Boilers....14		
Manley.....	Kinematics.....25		Kinematics.....14	
House.....	Carpentry.....6	Carpentry.....8	Pattern Making.....11-14	
Wabnitz.....	Apprentices all day			
Ridenour.....	Foundry.....13		Foundry.....11	
Marx.....	Blacksmithing I.....20-14		Blacksmithing I.....8	
Barnes ²	Ad. Physiology, 29		Bact. ¹27; Phys. Lab.....27	
Bourne.....		A. Physiology...31	Phys. Lab.....31; El. Physiology...12	
Dickens ²	Veg. Gardening 33	Horticulture...53		Sp. Horticul...2
Eastman ²		Forestry.....1	Forestry.....19	
Brink.....	Eng. Lit. II....32	Eng. Lit. II....28	Eng. Literature 28	Eng. Literature 35
Rupp.....	Rhetoric II....15	Classics.....34	Readings.....25	Am. Literature 24
Rice.....	Rhetoric I.....35	Structure.....45	Rhetoric I.....45	Composition....27
Hopps.....			Composition...18	Classics.....40
Ten Eyck ²				Agriculture...26
Shoesmith ²			Ther. Cookery.....15-15	
Calvin.....				
Rose.....			El. Cooking.....10-13	
Pancake.....			Civics.....40	Civics.....60
Price.....	Am. History...28	Civics.....35	Oratory II...25-26	Oratory II ¹ ...21
Kammeyer.....	Am. Breeding...27	Oratory I...18-17		
Wheeler ²		Stock Judging..28		
Menzies ²				
Rickman.....	Printing.....5	Printing.....1	Printing.....4	Printing.....4
Rodell.....	Algebra I.....28	Algebra I.....31	Bookkeeping...36	Geometry II....25
McFarland.....	Readings.....28	Grammar B....12	Algebra III....29	Algebra III....26
Holroyd.....	Arithmetic A...35	Algebra II....32	Grammar B....27	Arithmetic B...22
Short.....	Geography.....8	History A.....35	History B.....11	
Thompson.....	Sew. III & IV..16		Adv. Sewing...8	Dressmaking...6
Jones.....				
Cowles.....	Sewing III...15	Sewing III....21	Sewing II...18	Sewing II....15
Coe.....	Sewing I.....9	Sewing I.....8	Sewing III ¹	Sewing II....21
Fearon.....	Calisthenics.....			
Lund.....	Apprentices.....			

¹ Every other day.² Experiment Station work.

Morning Class Hours (Tu. Wed. Thur. Fri. Sat.):

1. From 8:35 to 9:20.
2. From 9:25 to 10:10.
3. From 10:15 to 11:00.
4. From 11:05 to 11:50.

INSTRUCTOR, SUBJECTS, AND NUMBER IN CLASS.

Fifth Hour.	Sixth Hour.	Eighth Hour.	Ninth Hour.
Descriptive Geometry.....32			
Advanced Object Drawing.....17			
El. Projection.....23-22			
Object Drawing.....33			
Geometrical Drawing.....32-37			
Freehand Drawing.....32			
Or. Ch. TTS.....11	Anal. Chem. ¹23	Advance Chem.....7	
Anal. Chemistry and Laboratory...27			
C. Met. W & F.....13			
Chemistry Laboratory.....23			
Entomology Laboratory, Monday A. M.....27			
Zoological Laboratory.....19-19			
Geometry I.....34			
Geometry II.....25			
Algebra III.....13			
Dynamo Laboratory.....7-7			
Physics Laboratory.....20			
Electrical Engineering Laboratory.....18			
Elementary Botany.....35			
Engineering Laboratory.....10-13			
Machine Design.....10-10			
Mechanical Drawing ¹26			
Engineering Laboratory ¹13			
Pattern Making.....15-9			
Machine Shop.....8 8		Machine Shop.....3-1	
Foundry.....26		Foundry.....1	
Blacksmithing I 20, II.....14		Blacksmithing I.....20-12	
Bacteriology Laboratory.....27			
Adv. Physiology Laboratory, Tuesday.....2			
Horticulture Industrial.....6-3			
Structure.....21	Classics.....27		
Crop Production.....29	Grain Judging.....28		
Domestic Science III.....16-17			
American History...10			
Printing.....3	Printing.....2	Cheese Making.....4	
Bookkeeping.....1		Printing, Monday 5 hours.....5	
Algebra II.....27			
Advanced Sewing.....19			
Dressmaking Laboratory.....10			
Engines and Boilers.....40			

Afternoon Class Hours (Tu. Wed. Thur. Fri. Sat.):

5. From 1:05 to 1:50.
6. From 1:55 to 2:40.
7. Drill from 2:45 to 3:30.

THE LIBRARY OF CONGRESS.

THE first appropriation for this library was made in April, 1800, while Congress was sitting in Philadelphia. The library was kept in a portion of the Capitol building. The first catalogue was issued in 1802, the books being divided according to size instead of subject. The collection was entirely destroyed by fire in 1814 by the British troops that entered Washington. Jefferson then offered the government the larger portion of his library, comprising about seven thousand volumes, for what they had originally cost him. The offer met with much opposition, but was finally accepted by Congress. In 1850, the library contained about fifty-five thousand volumes. More than half of the collection was destroyed by fire the next year. Congress made liberal appropriation for the purchase of new books.

While the general management of the library is in the hands of a joint committee of Congress, the membership of the committee changes so often that the librarian is really at the head of the institution. Mr. Spofford, then librarian, first brought the necessity for a new building before Congress in 1872. The act for a separate building received a large majority in 1886. A site of ten acres was purchased near the Capitol for \$585,000. The cost of the building was not to exceed \$5,500,000, in addition to appropriations previously made, with accommodations for four and one half millions of volumes. The building is larger, safer and costlier than any other library in the world and is absolutely fire-proof. It is four hundred seventy feet long, three hundred forty wide, and occupies nearly four acres. The exterior walls form a rectangle, which encloses a cross that divides the open space within into four courts, each one hundred fifty feet long by about seventy-five wide.

The main reading-room at the intersection of the arms of the cross is an octagon, made conspicuous by its dome and lantern. The lantern is surmounted by a great blazing torch with a gilded flame, the emblematic Torch of Learning.

The exterior walls of the library are constructed entirely of granite, producing the effect of white marble. The building is in three stories. In the main entrance are three massive bronze doors. The art of printing is the subject of the decoration of the central door; to the left, tradition; to the right, writing. It would be impossible even to attempt a satisfactory description of the

main entrance hall. It is built of white Italian marble. The grand staircase must be passed by with only a word. In the ascending railing of each staircase is a marble figure of a little boy, representing the habits and pursuits of modern life. On two sides of the hall are tablets having the names of the following authors in gilt letters: Longfellow, Cooper, Scott, Tennyson, Gibbon, Cervantes, and Hugo.

The Mosiac vaults have panels of Italian marble and floors of white, brown, and blue marble. The ceilings are of marble mosiac. In the vault of the west corridor are figures representing zoölogy, physics, mathematics, and geology; of the east, archæology, botany, astronomy, and chemistry. Each science is represented by a female figure over seven feet in height. The colors that occur most frequently in chemical experiments predominate in the figure of chemistry. Lines of drapery and color are suggestive of particular sciences. The figure representing botany stands on the pad of a water lily, analyzing its flower. The long stem coils about her body to the water. Tablets bearing the names of men distinguished in the sciences are placed at both ends. These inscriptions may be seen on either side of the list of names: "The first creature of God was the light of sense; the last was the light of reason." "The light shineth in darkness, and the darkness comprehendeth it not." "In nature all is useful, all is beautiful."

"All are but parts of one stupendous whole,
Whose body Nature is and God the soul."

In the north corridor, are decorations representing the five senses. Wisdom, understanding, knowledge and philosophy are represented in four circular panels on the wall. The inscriptions are from Adelaide A. Proctor's poem, Unexpressed:

"Dwells within the soul of every artist
More than all his effort can express."

"No great thinker ever lived and taught you
All the wonder that his soul received."

"No great painter ever set on canvas
All the glorious visions he conceived."

There are six small domes in the passageway leading to the reading-room, beautifully ornamented. At the head of the staircase, one steps into the gallery which affords a view of the great domed reading-room. This room is octagonal in shape, and from

the floor to the top of the dome is one hundred twenty-five feet. The arrangements are such that a person may pass through doors in the partition from one alcove to another on either floor, and may go up or down, from story to story, by means of a winding staircase. In this room are eight statues to represent different features of civilized life: Philosophy, religion, commerce, history, art, poetry, law, and science. Above the figure of religion is the following inscription:

"What doth the Lord require of thee but to do justly, and to love mercy, and to walk humbly with thy God." Above commerce: "We take the spices of Arabia, yet never feel the scorching sun which brings them forth."

Above history:

"One God, one law, one element,
And one far-off divine event,
To which the whole creation moves."

Above art:

"As one lamp lights another, nor grows less,
So nobleness enkindleth nobleness."

Above philosophy: "The inquiry, knowledge and belief of truth is the sovereign good of human nature." Above poetry: "Hither as to their fountain, other stars repairing, in their golden urns, draw light." Above law: "Of law there can be no less acknowledged than that her voice is the harmony of the world." Above science: "The heavens declare the glory of God, and the firmament sheweth His handiwork."

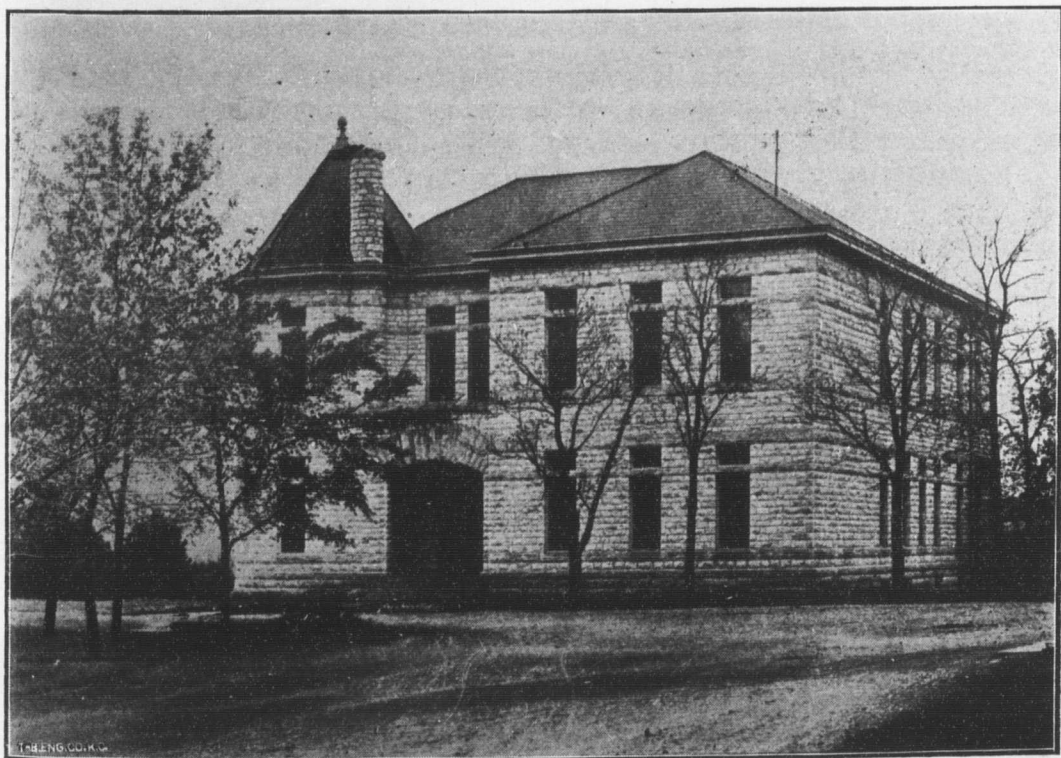
The rooms on the second floor are used as exhibition halls for the works of art and books that are of special interest on account of their rarity and curiosity. The most beautifully decorated of these rooms are the corner pavilions and two of the galleries. The Pavilion of the Seals is in the second story and illustrates the seals of the various executive departments of the United States. In this pavilion is a circular tablet about six feet in diameter, painted to represent wood. On this are inscribed, as if in raised letters, quotations selected by the librarian from the writings and speeches of prominent American statesmen. In the State and Treasury Departments, are these quotations: "Let our object be our country, our whole country, and nothing but our country." "Thank God I also am an American." "Equal and exact justice to all men, of whatever state or persuasion, religious or political: peace, commerce, and honest friendship with all nations—

entangling alliances with none." "Let us have peace." "The aggregate happiness of society is, or ought to be, the end of all government." "To be prepared for war is one of the most effective means of preserving peace." "The agricultural interest of the country is connected with every other, and superior in importance to them all."

Perhaps the most richly and lavishly ornamented room is the special reading-room for the members of the House. The floor is of dark oak. Above the dado of heavy oak paneling, the walls are hung with olive-green silk. The ceiling is finished in gold and colors, with painted decorations in the panels. There is a large mosaic panel over the fireplace, representing law at one end of the room and history at the other. The Senate reading-room has walls of Vermont marble. The ceiling is finished entirely in gold. Above the oak dado, the walls are covered with red silk.

Many valuable private libraries will eventually find a home in this library. The late Dr. J. M. Toner, of Washington, presented his collection, which is remarkable for its Washington letters collected for a number of years, either in the original or in copies.

EMMA J. SHORT.



Domestic Science Hall.

THE INDUSTRIALIST.

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Manhattan, Kansas.

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LOCAL NOTES.

The mid-term examinations will be held on Saturday, May 7.

The carpenter-shop is making three new teachers' desks for the Chemistry Department.

Prof. A. B. Brown, Asst. R. H. Brown and a number of music-loving students went to Topeka on Saturday to hear "Parsifal."

The *Kansas Farmer* publishes a half-tone of our big six Percheron mare team. The paper calls it "a judicious combination of good blood, good feed and good brains."

The Hamilton Literary Society will play "Michael Strogoff" in the Manhattan opera-house next Tuesday and Wednesday nights. The first performance will be given for invited guests and the second for the public in general. The proceeds of the second night will go to the College Athletic Association.

Doctor Blachly, of Manhattan, the government weather observer, has been appointed as the official river observer at this point. He will make one telegraphic report each day except during extreme variations, when rapid rising and falling occur, then he will report oftener. His duties begin April 15.

The ladies' minstrel of Manhattan will net the City Library Association a handsome amount. They have settled all bills of expense and the amount cleared will reach about \$420. The exact amount of gross receipts was \$523.85 for the three nights. The ladies are all pleased in every way, more especially with the financial end.

The first baseball game of the season on the home grounds was played last Thursday with Ft. Riley, the College team winning by 7 to 6. The game was a fairly good one. Our men showed up well and won the game by good playing. Caldwell pitched a good game and Mallon, A. Cassell and Putnam were winners. Corr and Seagerts formed the battery for the soldiers. The attendance was large and enthusiastic.

It may be too late this spring to improve Bluemont avenue and Vattier street, the two streets running east from the main entrances to the College, but in the summer or fall the city should do something for these thoroughfares. Vattier street should have a good brick sidewalk from the College gate to the baseball park and Bluemont avenue should be drained, graded, and planted in four rows of trees. Let the new city council inspect the ground and do something—make a move!

The Faculty have ordered that henceforth and forever the students excused from military drill for physical defects shall be assigned to special industrial work, under the direction of the President. This new regulation will probably have a curative effect on lame heels, sore wrists and defective hearing among the freshmen and sophomores.

The Y. M. C. A. has issued a neat illustrated pamphlet of twenty-four pages containing a report of their work for the past year. We read from its columns that the organization is in a flourishing condition, that they have expended over \$1500 during the year, and that they are looking forward to the erection of a long-needed Y. M. C. A. hall.

The Board of Regents held their regular spring meeting on Wednesday and Thursday of this week. They accepted the new Dairy building, leaving the final settlement to a committee, and transacted the usual business of the spring term. A main part of the meeting was devoted to the discussion of the revised courses of study, presented by the Faculty and a special committee of the Board. The courses were adopted with a few unimportant changes. We will publish a synopsis of the revision in the next number of the INDUSTRIALIST.

BULLETIN OF REDUCED RATES.—Travelers of an economical turn of mind will be interested in these low rates. They apply from Manhattan, Kan., to San Francisco, Los Angeles, Portland, Seattle, and Tacoma, \$25, to-day and every day until April 30. Home-seekers' excursions to the West and Southwest, one fare plus \$2 for the round trip, April 5 and 19. California and return, \$45, April 23 to May 1. Full information at all Rock Island ticket offices, or by addressing: A. E. Cooper, D. P. A., Topeka, or J. A. Stewart, General Agent, Kansas City. tf

A large squad of students volunteered to work on the ball diamond at Athletic Park, Monday, putting it in fine shape. There were about forty of them, and they worked hard all day. About one hundred twenty loads of dirt were hauled and spread over the diamond. The girls are showing a lively spirit this year and are encouraging the baseball situation. Twenty five of them appeared at the park while the boys were working and gladdened their hearts by serving them with doughnuts and coffee. They also enlivened things by giving the College yell.

ALUMNI AND FORMER STUDENTS.

Born, April 13, 1904, to Mr. and Mrs. S. J. Adams ['98 and '96], Loveland, Colo., a boy.—*Nationalist*.

F. E. LaShelle, '99, is the editor of the *Wray Rattler*, published at Wray, Yuma county, Colorado. He makes a good paper.

Leslie A. Fitz, '02, took a few days' vacation from his work at the Coöperative Cereal Experiment Station, at McPherson, and visited the College and his sister, of the senior class.

H. W. Mattoon, second year in 1892, is interested in fruit lands in northern Arkansas on a new railroad in the Ozark region.

E. J. Abell, '95, and Mrs. Abell announce the birth of a son, Fredrick Burdette Abell, March 23. Mrs. Abell was Miss Florence A. Quantic, and a student in 1892.

Lieut. Ned M. Green ['97] arrived this morning from California and is visiting his sister, Mrs. J. E. Edgerton. He has recently been appointed first lieutenant and will receive his station in a few days.—*Nationalist*, April 13.

The Twenty-third Avenue Presbyterian Church, Denver, Colo., of which Chas. A. Campbell, '91, is pastor, raised \$21,000 at its jubilee meeting April 3, \$12,000 of which will wipe out the church debt. The church is evidently prospering under Reverend Campbell's ministration. He has filled the pastorate since June, 1902.

From press notices and through other channels we are impressed with the fact that W. H. Olin, '89, assistant in farm crops at the Iowa State College, is a very active member of the official staff of that institution. The energy which he showed as a student and later as a public school teacher in this State seems not to have abated in the least.

Mrs. Elva Palmer Thackrey, '96, writes from 2746 Bellview Avenue, Kansas City, Mo., of her continued interest in the College. Mr. Thackrey, '93, is beginning his fourth year's work there, and dedicated a new church April 17. Mr. and Mrs. Thackrey do not meet alumni as often as they would wish and are always glad to welcome or hear from their friends.

At high noon on Thursday, April 14, a son put in his appearance at the home of Dr. and Mrs. W. A. McCullough, class of '98. He announced his arrival by giving the College yell—much to the delight of his grandfather and grandmother, Judge and Mrs. Wilder, who think from present appearance that before many years he will be blowing a cornet in the College orchestra. A welcome is given the young man, William Wilder McCullough, that extends from Dan to Beersheba.—*Nationalist*.

Miss Helen Knostman, '01, was married last Wednesday evening, April 6, to Mr. S. Jas. Pratt, at the First Methodist Church in Manhattan. The bride is well known in College circles, and is equally popular among Manhattanites. The groom is well known as the genial assistant cashier of the Union National Bank, and enjoys the friendship of hundreds of city and College folk. The beautiful ring ceremony was performed by Rev. W. C. Hanson while the sweet strains of "Annie Laurie" were wafted from the grand pipe organ, played by Professor Hofer. Miss Olivia Staatz, a former classmate of the bride, acted as her maid of honor. Mr. Ben Hill acted as best man. The beautifully decorated church was filled with guests. Mr. and Mrs. Pratt will be at home in Manhattan after a few weeks' tour. We congratulate heartily.—*Students' Herald*.

Historical Society

VOL. 30

NO. 27

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

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THE INDUSTRIALIST.

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MANHATTAN, KAN., APRIL 23, 1904.

No. 27

THE NEW COURSES OF STUDY.

ON the following pages will be found an outline of the courses of study as approved by the [Board of Regents at their last meeting. The principal object of the revision was to reduce the number of class hours per week to fifteen and laboratory, including industrial time, to ten, not including drill or physical training. This is not intended to reduce the work required of the student, but to give more time for preparation: that is, quality rather than quantity of work is sought.

The introduction of a year and a half of German in four of the courses is the only new study added. An elective each term of the senior year is introduced in the agriculture and domestic science courses, and the elective during the senior year of the general science course is retained. This gives considerable opportunity to specialize along some particular line. Young women have the choice of physical training or music during the first two years of the course, and may elect music during the junior year.

Young men physically unable to take military drill will be required to elect an extra industrial, or, if physically unable to take an industrial, will be required to select some study not in his course, under the direction of the President.

Senior, junior and sophomore students not active members of one of the literary societies or serving on the editorial staff of a student paper will be required to attend Saturday afternoon rhetorical exercises. It is hoped that this will lead to a considerable increase in the number of literary societies. More societies are evidently needed in an institution of this size. The six societies now organized not being able to accommodate more than seventy-five members each, do not provide for nearly all the students that should be doing work in literary societies.

COURSES OF STUDY. FRESHMAN.

All Courses.

Geometry I.....	5
English.....	5
Botany II.....	5
<i>Field-work</i>	2
<i>Drawing</i>	2
<i>Woodwork or Sewing I</i>	4
<i>Drill</i>	4
<i>Physical Training or Music</i>	4

FALL TERM.

Geometry II.....	5
English.....	5
Cooking or Agriculture.....	5
Elementary Psychology.....	1
<i>Woodwork or Sewing II</i>	3
<i>Drawing</i>	4
<i>Drill</i>	4
<i>Physical Training or Music</i>	4

WINTER TERM.

Algebra IV.....	5
English.....	5
Physics.....	5
<i>Laboratory</i>	2
<i>Blacksmithing or Sewing III</i>	4
<i>Drawing</i>	2
<i>Drill</i>	4
<i>Physical Training or Music</i>	4

SPRING TERM.

Four-Year Courses.

Figures following studies show class hours per week. Subjects in *italic type* require no study outside of class.

Military drill is optional for young men of the third and fourth years.

The electives are chosen under the direction of the Faculty. In each case, the electives are expected to be in the same line as nearly as possible. The following list is announced for the different courses:

Agriculture.

German.
Agronomy.
Animal Husbandry.
Dairying.
Horticulture.
Veterinary Science.
Bacteriology.
Plant Morphology.
Plant Breeding.

Domestic Science.

Music.
Pedagogy.
Trigonometry.
Physics I and II.
American Literature.
Logic.
Ethics.
Plant Morphology.
Geology.
Vegetable-gardening.
Bacteriology.

General Science.

Mathematics.
Entomology.
Bacteriology.
Pedagogy.
Botany.
Domestic Science.
Agriculture.
Zoölogy.
Chemistry.

COURSES OF STUDY—Continued. SOPHOMORE.

Agriculture.		Domestic Science.		General Science.		Mechanical Engineering.	
Chemistry..... 5		Chemistry..... 5		Chemistry..... 5		Chemistry..... 5	
Laboratory..... 2		Laboratory..... 2		Laboratory..... 2		Laboratory..... 2	
Dairying..... 2½		Physiology..... 5		Trigonometry..... 5		Trigonometry..... 5	
Laboratory..... 6		Laboratory..... 2		Surveying..... 2		Surveying..... 2	
Trigonometry..... 5		German..... 5		German..... 5		Shop Lectures..... 1	
Surveying..... 2		Public Speaking..... 2½		Industrial..... 4		German..... 5	
Public Speaking..... 2½		Music..... 4		Drill..... 4		Projection Drawing..... 2	
Drill..... 4		or Physical Training, 4		Music..... 4		Shop..... 2	
				or Physical Training, 4		Drill..... 4	
Chemistry..... 5		Chemistry..... 5		Chemistry..... 5		Chemistry..... 2½	
Laboratory..... 2		Laboratory..... 2		Laboratory..... 2		Laboratory..... 4	
Breeds of Stock..... 2½		Horticulture..... 5		Entomology..... 5		Kinematics..... 5	
Stock Judging..... 4		Floriculture..... 2		Laboratory..... 2		German..... 5	
Physiology..... 5		German..... 5		German..... 5		Descriptive Geometry..... 4	
Laboratory..... 2		Dressmaking & Fabrics..... 6		Public Speaking..... 2½		Public Speaking..... 2½	
Public Speaking..... 2½		Music..... 4		Projection Drawing..... 2		Shop..... 2	
Drill..... 4		or Physical Training, 4		Drill..... 4		Drill..... 4	
				Music..... 4			
				or Physical Training, 4			
Chemistry..... 2		Chemistry..... 2½		Chemistry..... 2		Chemistry..... 2½	
Laboratory..... 8		Laboratory..... 6		Laboratory..... 8		Laboratory..... 4	
Horticulture..... 5		Entomology..... 5		Physiology..... 5		German..... 5	
Laboratory..... 4		Laboratory..... 2		Laboratory..... 2		Analytical Geometry..... 5	
Rhetoric II..... 5		Public Speaking..... 2½		Public Speaking..... 2½		Public Speaking..... 2½	
Drill..... 4		German..... 5		German..... 5		Shop Lectures..... 1	
		Music..... 4		Drill..... 4		Mechanical Drawing..... 2	
		or Physical Training, 4		Music..... 4		Shop..... 2	
				or Physical Training, 4		Drill..... 4	

FALL TERM.

WINTER TERM.

SPRING TERM.

COURSES OF STUDY. FRESHMAN.

All Courses.

FALL TERM.	Geometry I.....	5
	English.....	5
	Botany II.....	5
	Field-work.....	2
	Drawing.....	2
	Woodwork or Sewing I.....	4
	Drill.....	4
	Physical Training or Music.....	4
WINTER TERM.	Geometry II.....	5
	English.....	5
	Cooking or Agriculture.....	5
	Elementary Psychology.....	1
	Woodwork or Sewing II.....	3
	Drawing.....	4
	Drill.....	4
	Physical Training or Music.....	4
SPRING TERM.	Algebra IV.....	5
	English.....	5
	Physics.....	5
	Laboratory.....	2
	Blacksmithing or Sewing III.....	4
	Drawing.....	2
	Drill.....	4
	Physical Training or Music.....	4

Four-Year Courses.

Figures following studies show class hours per week. Subjects in *italic type* require no study outside of class.

Military drill is optional for young men of the third and fourth years.

The electives are chosen under the direction of the Faculty. In each case, the electives are expected to be in the same line as nearly as possible. The following list is announced for the different courses:

Agriculture.	Domestic Science.	General Science.
German.	Music.	Mathematics.
Agronomy.	Pedagogy.	Entomology.
Animal Husbandry.	Trigonometry.	Bacteriology.
Dairying.	Physics I and II.	Pedagogy.
Horticulture.	American Literature.	Botany.
Veterinary Science.	Logic.	Domestic Science.
Bacteriology.	Ethics.	Agriculture.
Plant Morphology.	Plant Morphology.	Zoölogy.
Plant Breeding.	Geology.	Chemistry.
	Vegetable-gardening.	
	Bacteriology.	

COURSES OF STUDY—Continued. SOPHOMORE.

Agriculture.		Domestic Science.		General Science.		Mechanical Engineering.	
Chemistry..... 5		Chemistry..... 5		Chemistry..... 5		Chemistry..... 5	
Laboratory..... 2		Laboratory..... 2		Laboratory..... 2		Laboratory..... 2	
Dairying..... 2½		Physiology..... 5		Trigonometry..... 5		Trigonometry..... 5	
Laboratory..... 6		Laboratory..... 2		Surveying..... 2		Surveying..... 2	
Trigonometry..... 5		German..... 5		German..... 5		Shop Lectures..... 1	
Surveying..... 2		Public Speaking..... 2½		Industrial..... 4		German..... 5	
Public Speaking..... 2½		Music..... 4		Drill..... 4		Projection Drawing..... 2	
Drill..... 4		or Physical Training, 4		Music..... 4		Shop..... 2	
				or Physical Training, 4		Drill..... 4	
Chemistry..... 5		Chemistry..... 5		Chemistry..... 5		Chemistry..... 2½	
Laboratory..... 2		Laboratory..... 2		Laboratory..... 2		Laboratory..... 4	
Breeds of Stock..... 2½		Horticulture..... 5		Entomology..... 5		Kinematics..... 5	
Stock Judging..... 4		Floriculture..... 2		Laboratory..... 2		German..... 5	
Physiology..... 5		German..... 5		German..... 5		Descriptive Geometry..... 4	
Laboratory..... 2		Dressmaking & Fabrics..... 6		Public Speaking..... 2½		Public Speaking..... 2½	
Public Speaking..... 2½		Music..... 4		Projection Drawing..... 2		Shop..... 2	
Drill..... 4		or Physical Training, 4		Drill..... 4		Drill..... 4	
				Music..... 4			
				or Physical Training, 4			
Chemistry..... 2		Chemistry..... 2½		Chemistry..... 2		Chemistry..... 2½	
Laboratory..... 8		Laboratory..... 6		Laboratory..... 8		Laboratory..... 4	
Horticulture..... 5		Entomology..... 5		Physiology..... 5		German..... 5	
Laboratory..... 4		Laboratory..... 2		Laboratory..... 2		Analytical Geometry..... 5	
Rhetoric II..... 5		Public Speaking..... 2½		Public Speaking..... 2½		Public Speaking..... 2½	
Drill..... 4		German..... 5		German..... 5		Shop Lectures..... 1	
		Music..... 4		Drill..... 4		Mechanical Drawing..... 2	
		or Physical Training, 4		Music..... 4		Shop..... 2	
				or Physical Training, 4		Drill..... 4	

FALL TERM.

WINTER TERM.

SPRING TERM.

COURSES OF STUDY—Continued. JUNIOR.

FALL TERM.			WINTER TERM.			SPRING TERM.								
Agriculture.			Domestic Science.			General Science.			Mechanical Engineering.			Electrical Engineering.		
European History	5		Rhetoric II.....	5		European History	5		Differential Calculus ...	5		Differential Calculus ...	5	
Veterinary Science.....	5		Human Nutrition.....	5		Horticulture.....	5		Physics.....	5		Physics.....	5	
Animal Nutrition.....	5		Domestic Science.....	2		Bacteriology.....	2½		Bacteriology.....	4		Laboratory.....	4	
Bacteriology.....	2½		Laboratory.....	4		Laboratory.....	4		Mechanics.....	2½		Mechanics ..	2½	
Laboratory.....	4		German	2½		German	2½		Shop Lectures.....	1		Shop.....	2	
Horticulture Laboratory, 2			Color and Design.....	4		Linear Perspective.....	4		Shop.....	4		Mechanical Drawing.....	4	
			Laundrying	2		Industrial	2		Mechanical Drawing.....	4				
			Music Elective.											
American History.....	5		European History	5		American History	5		Integral Calculus	5		Integral Calculus.....	5	
Crop Production.....	5		Bacteriology.....	2½		Rhetoric II.....	5		Physics.....	5		Physics.....	5	
Laboratory.....	2		Laboratory.....	4		Zoölogy	5		Laboratory.....	4		Laboratory.....	4	
Entomology	5		Domestic Science.....	2		Laboratory.....	4		European History	5		European History	5	
Laboratory.....	2		Laboratory.....	4		German	2½		Mechanical Drawing.....	4		Mechanical Drawing.....	4	
Agr. Chemistry Lab	4		German	2½			2½		Shop.....	2		Shop.....	2	
			Home Decoration	2½										
			Music Elective.											
Civics	5		American History	5		Civics	5		Definite Integrals.....	2½		Differential Equations... 2½		
Stock Feeding.....	3		Zoölogy	5		Physics.....	5		Valve Gears	2½		Electricity.....	5	
Agricultural Chemistry, 2			Laboratory.....	4		Laboratory.....	4		American History	5		Laboratory.....	6	
Vegetable-gardening....	5		Domestic Science.....	2		Logic.....	5		Rhetoric II.....	5		American History	5	
Farm Mechanics and			Laboratory.....	4		German	2½		Shop Lectures.....	1		Rhetoric II	5	
Management.....	5		Home Nursing	2½		Industrial	4		Shop.....	4				
			German	2½					Mechanical Drawing.....	4				
			Music Elective.											

COURSES OF STUDY—Concluded. SENIOR.

				General Science.		Mechanical Engineering.		Electrical Engineering.	
Agriculture.		Domestic Science.		General Science.		Mechanical Engineering.		Electrical Engineering.	
FALL TERM		Physics..... 5 Laboratory..... 4	Civics..... 5 English Literature..... 5 Dietetics..... 2½ Laboratory..... 6	Physics..... 5 Laboratory..... 2 Geology..... 5 Economics..... 5 Elective..... 5		Civics..... 5 Economics..... 5 Steam Boilers..... 2½ Laboratory..... 2 Graphic Statics..... 2½ Shop Lectures..... 1 Shop..... 2 Mechanical Drawing..... 4		Civics..... 5 Economics..... 5 D. C. Machines..... 4 Laboratory..... 4 Mechanical Drawing..... 4	
WINTER TERM		Physics..... 5 Laboratory..... 2 Economics..... 5 Geology..... 5 Elective..... 5	English Literature..... 5 Therapeutic Cookery..... 2 Laboratory..... 4 Psychology..... 5 Elective..... 5	English Literature..... 5 Plant Morphology..... 5 Laboratory..... 4 Elective..... 5 Industrial..... 4		English Literature..... 5 EL Thermodynamics..... 5 Laboratory..... 4 Applied Mechanics..... 5 Shop Lectures..... 1 Shop..... 2 Mechanical Drawing..... 2		D. C. Machines..... 5 Laboratory..... 4 English Literature..... 5 Applied Mechanics..... 5 Engr. Laboratory..... 4 Shop..... 2	
SPRING TERM		English Literature..... 5 Animal Breeding..... 5 Elective..... 5 Thesis..... 5	Home Sanitation..... 2½ Household Economics..... 2½ Economics..... 5 Elective..... 5 Thesis..... 5	English Literature..... 5 Psychology..... 5 Elective..... 5 Thesis..... 5		Applied Mechanics..... 5 Thermodynamics..... 2½ Hydraulics..... 2½ Mechanical Drawing..... 4 Thesis..... 5 Laboratory..... 2		A. C. Machines..... 5 Laboratory..... 4 Hydraulics..... 2½ Power Stations..... 2½ Dynamo Design..... 4 Thesis..... 5	

TO PRINTERS.

THE Printing Department has lately been experimenting in embossing, the result of which may prove interesting to printers wishing to do embossing cheaply on an ordinary platten press. One of the difficulties encountered by the average office has been that too many printers have been timid about experimenting with expensive embossing compounds. Here is where the results of our experiments may prove beneficial to the country printer trying to turn out tasty work.

Unless a person is good at engraving, it is more satisfactory and not very expensive to get the female die from the engravers. This may be either a wood engraving or a zinc etching. To prepare copy of a type form for the engraver, lock up form, make ready on a jobber with black ink, take an impression on tympan, and then take offset on some thin white paper—tracing paper, French folio, or the like—using as much ink as the form will stand to give a clear impression. This goes to the engraver. An original drawing is good copy.

It might be well to suggest that, as it is almost impossible to lock up a form twice exactly the same, the job should be run at the time the copy for the die is made. Use all the ink the job will stand without looking muddy or offsetting. A gloss ink gives the best effect. The ink should be thoroughly dry before embossing.

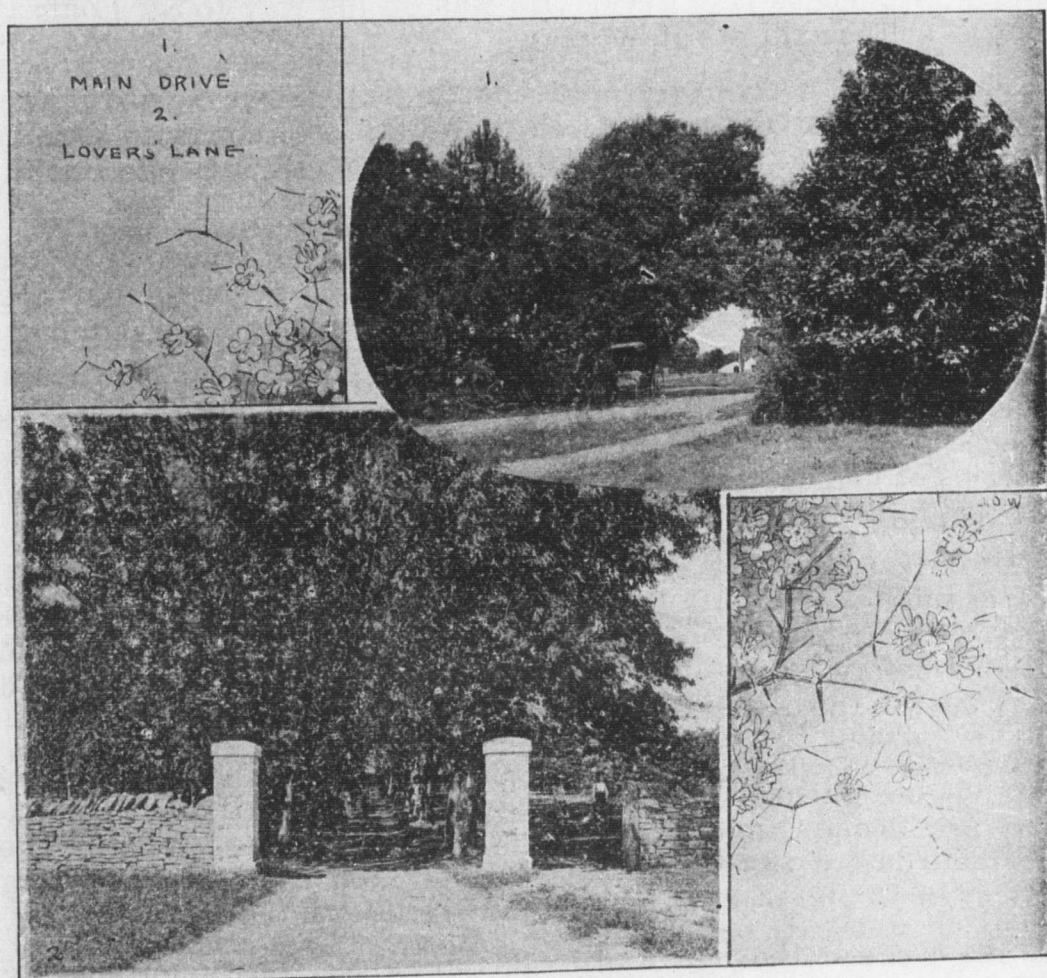
Lock up the female die and remove rollers from press. Take a small quantity of plaster of Paris and mix with ordinary flour paste to the consistency of putty. Spread on tympan, lay over it a sheet of tissue paper, take impression and let stand (with impression on) a minute or two, then let press run slowly for a few impressions. Cut off the edges of the die and let stand until it hardens. A die made in this way will stand several thousand impressions on heavy stock; in fact, will do for almost any run.

If the first attempt at making the male die fails, tear off and try again. A nickle's worth of plaster of Paris will be sufficient to experiment with and then have enough left to run the ordinary office a year or two. If the die does not "draw" perfectly, oftentimes it may be patched by adding a little of the compound over the defective parts and taking an impression on it.

Printers are oftentimes bothered with type and half-tones filling up and resisting all efforts at cleaning. From the *Inland Printer* we learned that white caustic potash cut in alcohol, using

as much potash as the alcohol will take up, will eat out the hardened ink from type and half-tones without injury.

Apply the "wash" on type with brush, just enough to cover face of type, and let stand two or three minutes. Wash off with brush and lye. For half-tones, put enough of the "wash" on an imposing stone to float the half-tone, face down, allowing it to remain in this position from one to five minutes, according to the condition of the half-tone. Wash off with lye or gasoline. You will be surprised at the result obtained. Care should be taken to keep this "wash" off of hands and clothes. J. D. RICKMAN.



THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College. Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

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LOCAL NOTES.

Professor Roberts is the happy father of a bran-new boy.

Prof. J. T. Willard has prepared some samples of Kansas sorghum sugar and syrup to be placed on exhibition at the World's Fair.

Miss Ella Weeks, of the Industrial Art Department, made a short visit at her parental home, in Lincoln, Kan., on Saturday and Sunday.

Prof. E. E. Elliott, of the Agricultural College at Pullman, Wash., visited us last week. He was on his way to St. Louis to look after the exhibits of his state.

The following College people went to Topeka on April 16 to attend the "Parsifal" concert: Prof. A. B. Brown, Asst. Eleanor Harris, Prof. and Mrs. J. T. Willard and son, Miss Lucile Brown, and Miss Stump.

Lightning struck the Professor Failyer residence, near the College, last Tuesday night and though it failed to set the building on fire, it did some damage to the electric lines and the chimney, and considerably scared the roomers.

Miss Nettie Wayland, of the senior class, at present teacher of domestic science in St. Louis, Mo., has again been engaged to give a series of demonstrations in home cooking at the Colorado Chautauqua, to be held at Boulder, next July.

Prof. E. A. Popenoe is on the program for the semiannual meeting of the Kansas State Horticultural Society, to be held at Dodge City, May 11 and 12. Roy Kellogg and W. L. Hall will also read papers before the meeting and Prof. A. Dickens will attend and take part in the discussions.

In spite of the cold and blustering April weather the College campus has turned green and velvety, the peech trees and wahoos are blooming and the lilacs and box-elders are leafing. The "Hill" is one of the most beautiful spots on earth when spring moves in—an ideal place for a great educational institution.

The walls of the new Auditorium are about ready for placing the iron roof trusses. The work of hoisting them into place and bolting them together firmly will be done by the Leavenworth Bridge Company and by men sent from their shops. The five trusses will cost the contractor over \$2500 when they are in place and ready for the rafters.

Fred Krotzer and Albert Deere, aged 13 and 15, who some time ago entered several of the College buildings and took keys, money and postage-stamps, were sentenced this week in the Riley county district court, by Judge S. Kimble, to the reform school.

The apprentices took turn last week at practicing with two very useful machines—the College traction engine and the city road grader. They hitched the two together and graded the avenue east of the College campus, and no better job could have been done by anybody. Mr. DeArmond acted as foreman and expert.

The April meeting of the Manhattan Horticultural Society was held on Thursday, April 21, at 3 o'clock P.M., in Horticultural Hall. The following program was presented: "Iris Culture," Prof. E. A. Popenoe; "Beautifying the Home Premises," T. C. Wells; "Celery, Its Culture and Storage," Prof. Albert Dickens.

The Y. M. C. A. is beginning a campaign for a new building. A score of upper classmen met last Sunday, and \$1150 was pledged in a twinkling. Committees were appointed to look after the various classes. Since the alumni are thinking of a memorial of some kind, here is the opportunity. No better method or object of investment can be found. Every student and alumnus ought to contribute something. Nothing short of a \$25,000 edifice should be permitted to suffice.—*Students' Herald*.

Warren Knaus, '82, editor of the *McPherson Democrat*, writes to Professor Walters that he is receiving many congratulations for his publication of the English translation of Dr. W. Horn's *Entomologische Briefe aus Amerika*. The Doctor himself, in a letter received a short time ago, praises the excellent and faithful translation. It should be added that the English translation is the work of Prof. D. E. Lantz, of this College, who is well versed in the intricacies of the vernacular of the Rhine and the Alps.

The Bluemont Quartet Concert Company gave an entertainment Saturday evening in Randolph before a large and appreciative audience. The quartet consists of Messrs. A. N. H. Beeman, W. O. Gray, E. J. Evans, and L. B. Bender. The other members of the company are R. H. Brown, violinist; Miss Bernice Dodge, reader; and Mrs. R. H. Brown, harpist. Mr. Bender is also a saxophone soloist. This company is composed entirely of College parties and is meeting with great success in their excellent entertainments.

BULLETIN OF REDUCED RATES.—Travelers of an economical turn of mind will be interested in these low rates. They apply from Manhattan, Kan., to San Francisco, Los Angeles, Portland, Seattle, and Tacoma, \$25, to-day and every day until April 30. Home-seekers' excursions to the West and Southwest, one fare plus \$2 for the round trip, April 5 and 19. California and return, \$45, April 23 to May 1. Full information at Rock Island ticket offices, or by addressing: A. E. Cooper, D. P. A., Topeka, or J. A. Stewart, General Agent, Kansas City.

Prof. J. D. Walters will go to St. Louis about the middle of May to set up the exhibit of the Kansas Dairy Association. The exhibit was planned and designed by him last winter, at the request of the officers of the association, and was unanimously adopted as a most beautiful and unique one. It consists in the main of an arch formed by about fifty large sunflower disks, under which a beautiful life-size woman operates a hand-separator. The background of the space is built up with Kansas dairy products. Every part of the exhibit, including all the inscriptions and decorations, will be modeled in plaster of Paris and covered with butter in different yellow tints, furnished by the Kansas creamery companies. The whole space will be enclosed by polished glass plates of very large size and the butter will be kept from melting by artificial refrigeration. It will take several barrels of plaster of Paris and a wagon load of butter for the plastic work required by the design.

The annual of the Hamilton Literary Society, given in the Manhattan opera-house last Tuesday night and repeated for the benefit of the Athletic Association on Wednesday night, was a success in every particular, though the attendance on the second night would have been larger if Jupiter Pluvius had been a little more kind with his weather doings. The program consisted of "Michael Strogoff," a drama in six acts. Professor Kammeyer assisted the society in their rehearsals and directed the stage work. The cast of characters was as follows: Michael Strogoff, J. C. Cunningham; Benjamin Franklin Blunt, H. C. Adams; Bonaparte Laidlaw, C. G. Elling; Ivan Ogareff, A. F. Cassell; Nadia Teodor, Henrietta Hofer; Sangaree, Ethel Alexander; Marfa Strogoff, Edith Felton; Czar, C. S. Dearborn; Grand Duke Michael, Ray B. Felton; General Kissoff, O. B. Whipple; Teofar, Emir of Bokhara, N. L. Towne; Madam Gogal, Mamie Cunningham; post agent, C. A. Pyles; tartar chief, R. A. Cassell; executioner, W. J. Brown; telegraph operator, T. Carlson.

ALUMNI AND FORMER STUDENTS.

A. L. Hallsted, '03, is farming near Havana, Kan.

J. R. Harrison, '88, is now chief post-office inspector, Federal Building, Kansas City, Mo.

M. A. Carleton, '87, and Mrs. Carleton announce the birth of a daughter, Rose, April 2, 1904.

L. W. Hayes, '96, 624 Van Buren street, Topeka, Kan., is a clerk in the freight department of the C. R. I. & P. Ry.

Emory S. Adams ['98], second lieutenant, Fourteenth Infantry, has been detailed as quartermaster of the army transport *Ingalls*. The *Ingalls* is the largest and fastest of the inter-island transports and the one used by the commanding general of the division and the Philippine commission when they wish to travel over the country.—*Nationalist*.

L. B. Jolley, '01, has been elected president of the Hahnemannian Society of the Chicago Homeopathic Medical College.

Geo. L. Clothier, '92, field assistant in the Bureau of Forestry, is the author of Circular No. 27, issued by that bureau, which treats of the "Reclamation of Flood-damaged Lands in the Kansas River Valley by Forest Planting." The circular is a valuable one and should be in the hands of every farmer to whom its recommendations will be of use.

We learn from the *Herald* that: Mark Wheeler, '97, has been promoted to a captaincy and assigned to the Sixteenth United States Infantry, stationed at Fort Slocum, N. Y. O. M. McAninch, '02, was married April 6 to Miss Carrie White, formerly a student in the same class. Dr. R. T. Nichols, '99, and wife are the parents of a son, born March 15.

S. N. Peck, '87, has been draughtsman in charge of car work for the A. T. & S. F. Ry., at the Topeka shops, for the past ten years, during the last four of which he has been chief car draughtsman of the Santa Fe system. After May 1 his headquarters will be at Chicago, and his address, Railway Exchange Building, corner of Michigan avenue and Jackson street.

M. A. Carleton, '87, delivered an address before the National Geographic Society, Washington, D. C., on "Scenes from Russian Life," April 2. He also delivered an address on "Russia and Her People," under the auspices of the Men's Club of the Gurley Memorial Church, Washington. Mr. Carleton's addresses were illustrated by many stereopticon views. It will be remembered that Mr. Carleton spent some months in Russia in connection with his work as cerealist of the United States Department of Agriculture.

A LETTER TO THE ALUMNI.

DEAR FRIENDS: Undoubtedly you have heard of the project discussed at the annual meeting of the Alumni Association of the Kansas State Agricultural College last June, to erect a memorial in the new auditorium at the College. On account of the small attendance at the meeting, it was the opinion of those present that it would be best to ascertain the opinions of the graduates as a whole before any definite plan of procedure was adopted. In furtherance of this idea, a committee was appointed to correspond with the members of the association for expressions of their views. This committee now addresses you, and asks that you at once write and give your personal opinion and preference in this matter.

The idea of this memorial grew out of the dedication, in the spring of 1903, of a window, in the Congregational church of Manhattan, to the memory of Dr. Geo. T. Fairchild, who for many years was a member of that church while he was President of the Kansas State Agricultural College. A number of the graduates of our College have expressed the thought that it would be appropriate to also place in our new auditorium something that would

be a tribute to the memory of this man who labored so long and faithfully for the upbuilding of our College. The memorial idea was first suggested by alumni who graduated while Doctor Fairchild was President of the College, and their intention was to erect something in his memory. It was later suggested that the plan be changed so as to include the three deceased ex-presidents, Joseph Denison, John A. Anderson, and Geo. T. Fairchild, in one memorial.

As to what would be appropriate to build as a memorial, several things have been suggested, such as a marble bust, a window, or a pipe-organ. It has also been suggested that scholarships be founded to encourage advanced study in lines emphasized at this institution and in which the several former presidents were especially interested. For example, we might have a Denison Scholarship in Literature, an Anderson Scholarship in Agriculture, and a Fairchild Scholarship in Science, or upon consideration more appropriate titles might be suggested. It has also been brought to the attention of the committee that a building for the College Y. M. C. A. would be a fitting memorial to any or all of the deceased ex presidents.

In order to enable the alumni to judge more intelligently, we may state that a bust of artistic merit would cost about \$1000, a window from \$300 and upwards, and a pipe-organ suited to our auditorium about \$5000. As to scholarships, each one should be not less than \$5000. This amount invested would yield only from \$200 to \$250 annually. Those who are planning for the future of the College Y. M. C. A. estimate that a building suited to their needs would cost \$25,000.

The alumni of our College now number close to one thousand, and they constitute a body of people well able to carry out some one of the projects now under discussion. Here is an opportunity for them to do something for the institution of which they are all proud. It may seem like a large undertaking to raise the required amount of money, but if every member of the association contributes something, there will be little difficulty in doing so. Now let everyone push this matter and let us place something at our College that will be a credit to the alumni and to the institution we love. Whatever plan is adopted should have the hearty support of the association.

To enable the committee to make a recommendation that will meet the approval of the alumni as a whole, we earnestly request the assistance of all. Please reply to the questions on the accompanying blank at an early date, and make such additional comments and suggestions as may occur to you.

Faternally,

J. C. CHRISTENSEN, '94,

J. T. WILLARD, '83,

CHAS. C. SMITH, '94,

Committee.

MANHATTAN, KAN., April 23, 1904.

QUESTIONS FOR REPLY.

Please fill out this blank and mail it AT ONCE to J. C. Christensen,
Manhattan, Kansas.

1. Would you favor the erection, by the Alumni Association, of a memorial to Geo. T. Fairchild?.....

2. If so, which of the following would you favor? State first and second choice:

(a) Pipe organ.....

(b) Marble bust.....

(c) Window.....

(d) Scholarship.....

(e) Y. M. C. A. building.....

(f).....

3. Would you rather favor the erection of a combined memorial to the three deceased ex-presidents—Joseph Denison, John A. Anderson, and Geo. T. Fairchild?.....

4 If so, what would you favor?

(a) First choice.....

(b) Second choice.....

5. If you favor scholarships, in whose memory should the first one be established?.....

6. Would you be willing to subscribe, according to your means, to one of the above projects?.....

7. Give additional suggestions below, or on the other side of this sheet.....

Your name..... Class of.....

Address..... Date..... 1904.

VOL. 30

NO. 28

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

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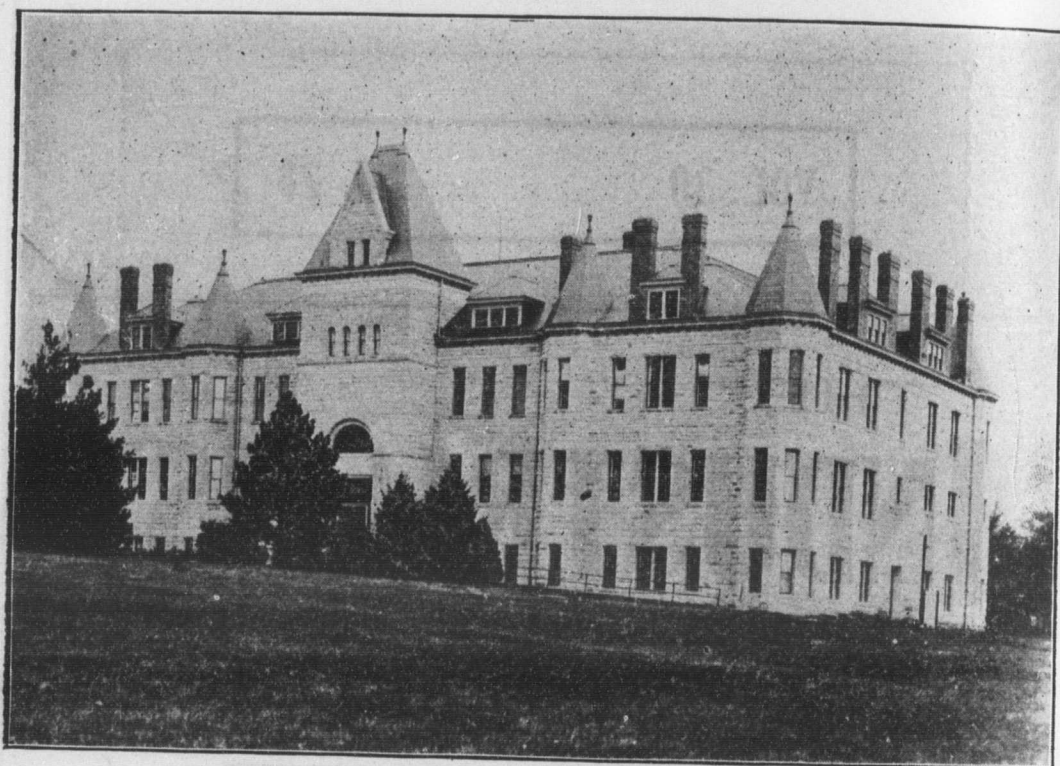
Editor-in-Chief, - PRES. E. R. NICHOLS
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Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
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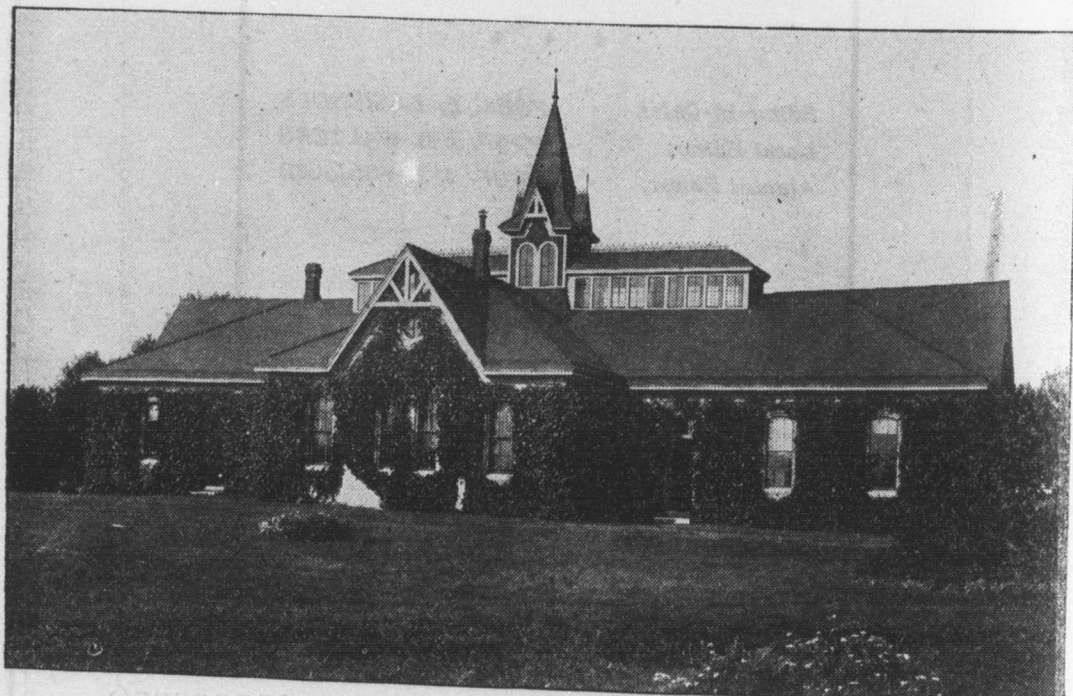
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Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.



PHYSICAL SCIENCE HALL.

Occupied by the Departments of Chemistry and Physics, chemistry having the east end, shown to the right.



THE OLD CHEMISTRY BUILDING
Burned May 31, 1900.

THE INDUSTRIALIST.

VOL. 30.

MANHATTAN, KAN., APRIL 30, 1904.

No. 28

THE CHEMICAL DEPARTMENT.

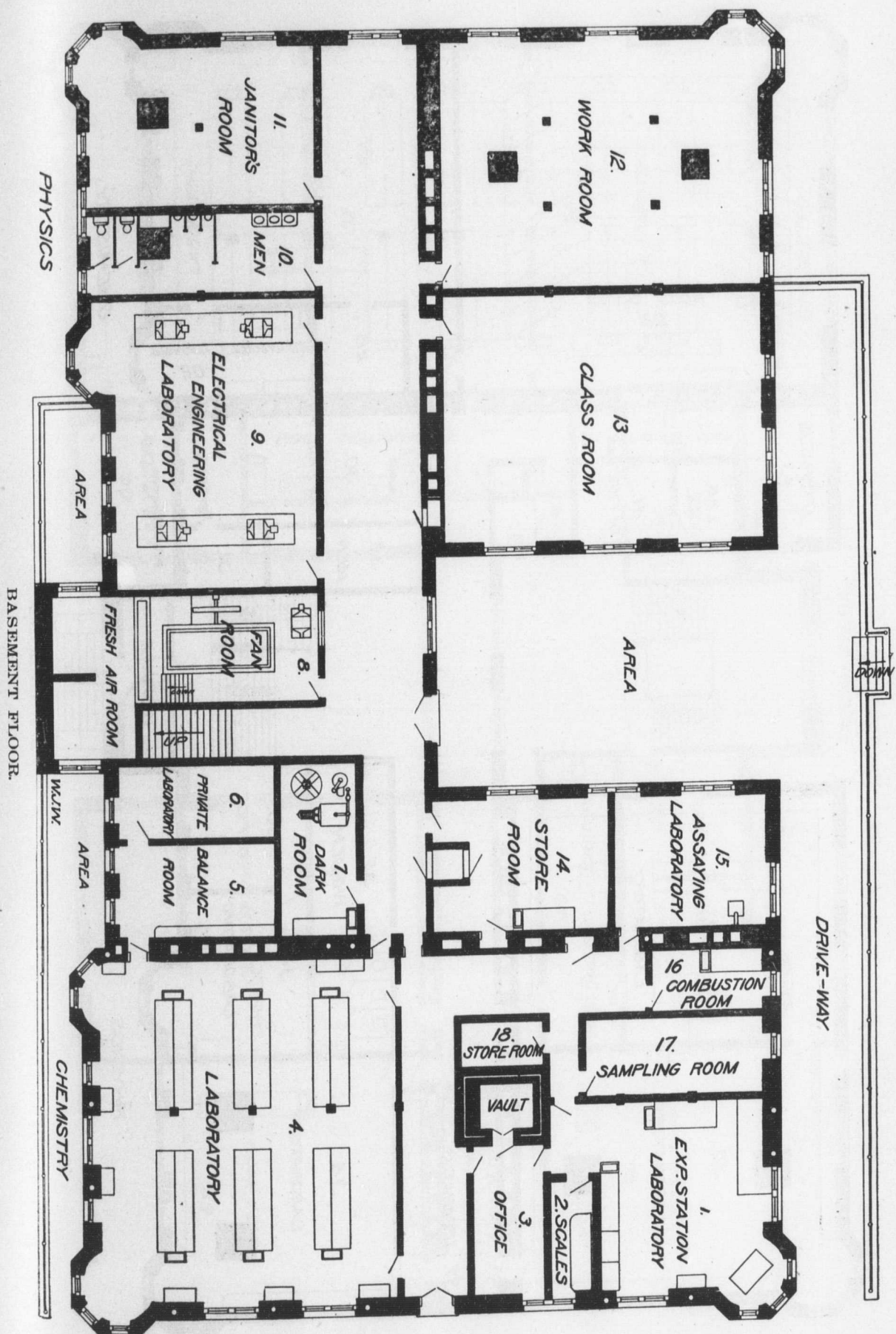
THE early history of the Chemical Department is bound up with that of physics, the two sciences being taught in one department until 1885. In the early years of the College even broader duties were laid upon the professor who taught these sciences. Prof. J. G. Schnebly, 1863-'65, and Prof. J. S. Hougham, 1867-'72, labored faithfully through those days of small things. In the catalogue for 1864-'65 we find a page devoted to the enumeration of the apparatus, which was as follows: "A large air-pump, a first-class electrical machine, one spirit lamp, two dozen test-tubes and stand, two wide-mouthed stopper glass jars, two tall plain cylindrical air-jars, a gas-bag provided with a stop-cock and bubble pipe, a set of small porcelain basins, glass tubing and small glass rods for stillers, two small glass funnels, a mortar and pestle, platinum foil and wire, a set of cork borers, a steel spatula, a set of earthen crucibles, a pair of gasometers for oxygen and hydrogen." In 1868 we find that "The College is well provided with a good assortment of philosophical and chemical apparatus, sufficient to perform all experiments required in teaching natural philosophy and chemistry. We have over two hundred and fifty pieces, embracing about one hundred and fifty different kinds of instruments."

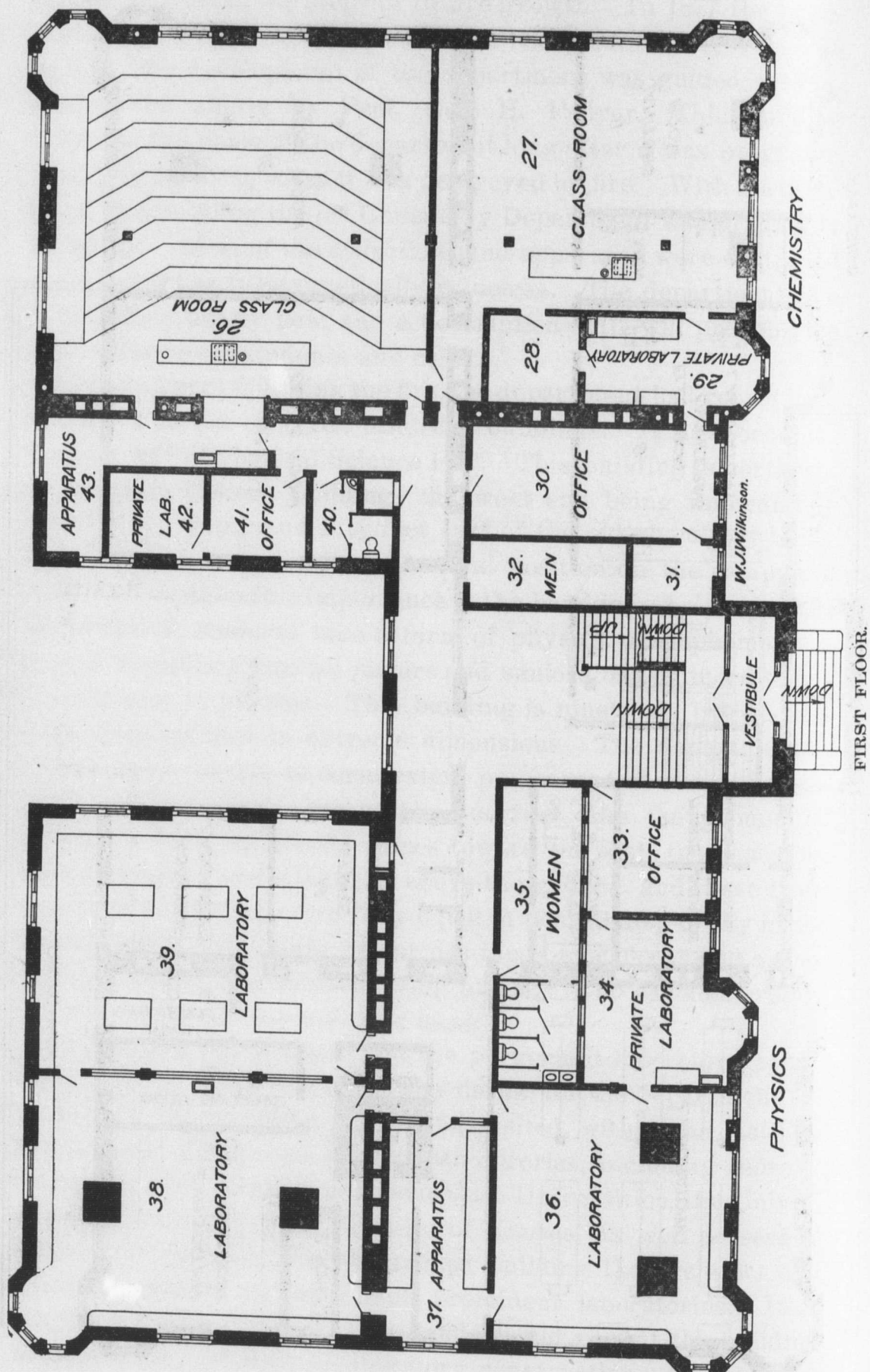
During these years the department had no quarters adapted to its needs, and its real beginning may be said to date from the election of W. K. Kedzie to the professorship of chemistry and physics, in 1873, after the advent of the Anderson administration. It is recorded that at that time "The whole chemical outfit of the institution was contained in a small box about two feet square." Professor Kedzie proceeded to make it "complete in all its appointments." He established the system of laboratory work by students that has been continued ever since. Space does not permit

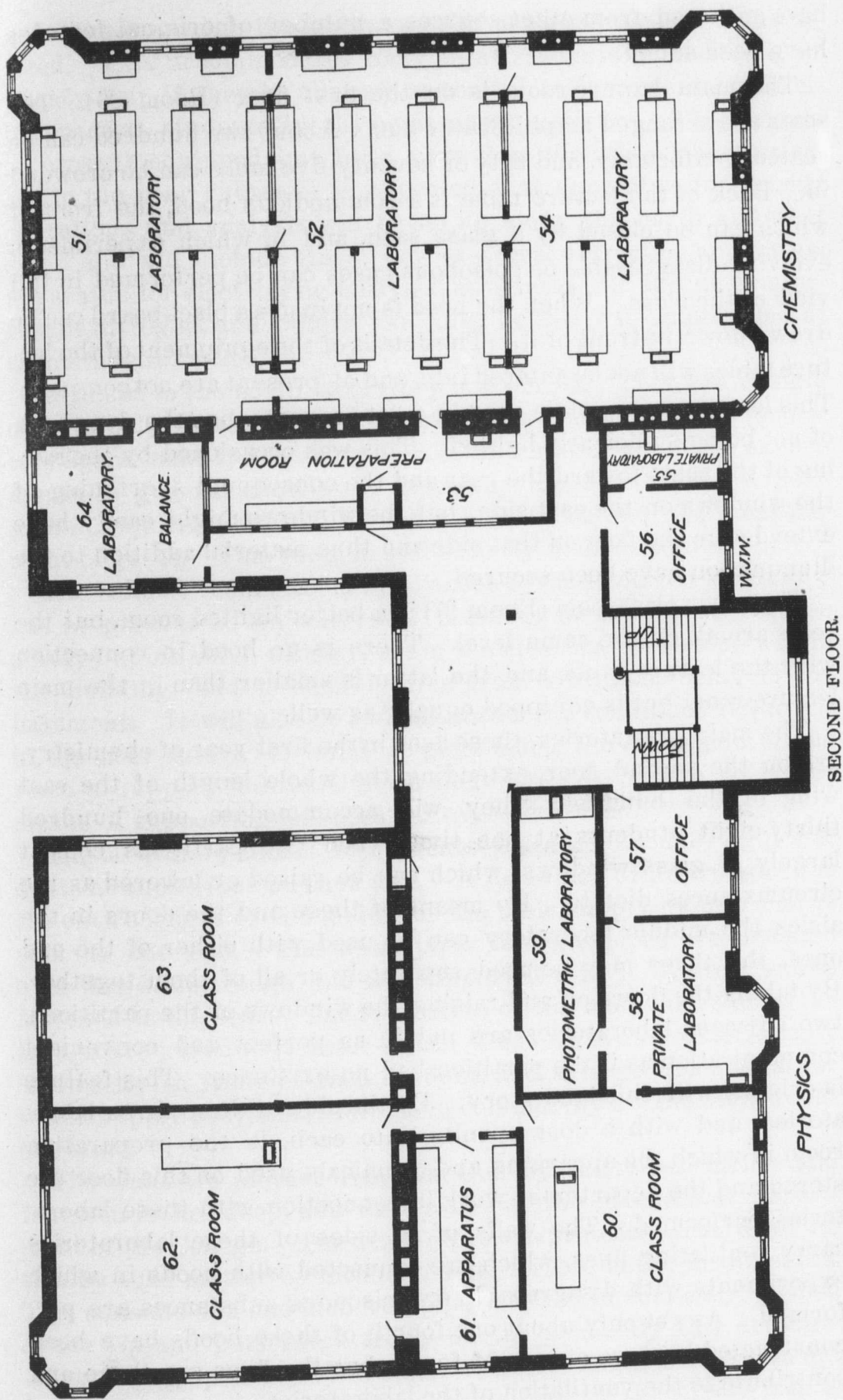
following in detail the steps of future growth. In 1877 the building designed by Professor Kedzie was occupied. Here, from 1878 to 1897, the development of the department was guided with industry and ability by Prof. Geo. H. Failyer. This building remained the home of the department long after it was outgrown, until May 31, 1900, when it was destroyed by fire. With the burning of this building the old Chemistry Department was practically wiped out. Most of the collections and apparatus were destroyed or injured so as to be practically valueless. The department now is therefore nearly new, and a description of it will probably be interesting to old students and others.

For two years following the fire, the department had rooms here and there in six or seven different buildings. It now occupies the east half of Physical Science Hall. This building is northeast of the Main College building, the west end being immediately north of the pump and fifty feet east of the old chemistry building. It therefore occupies a central position on the campus, a matter of considerable importance in the handling of classes since all freshmen students take a term of physics, all sophomores a year of chemistry, and all juniors and seniors one or more terms of chemistry or physics. This building is ninety-six by one hundred sixty-six feet in extreme dimensions. The department is already incommoded to some extent on account of want of room, but in most respects has ample quarters. As the ground on which the building stands slopes toward the east, the basement floor at the east end is slightly above the ground, and these basement rooms are therefore fully equal in desirability to any in the building, so that the department has three good floors and a commodious attic. The accompanying plans give an excellent representation of the rooms and their uses.

In planning the quarters and the permanent laboratory equipment, such as hoods and laboratory desks, for the department the writer had the advantage of having visited, within the last few years, some of the most modern laboratories, including those of Harvard, Johns Hopkins and Ohio State Universities, the University of Chicago and the University of Kansas, as well as several others. In planning the last named building the architect and Professor Bailey visited fifteen prominent laboratories. It is therefore believed that as far as funds would permit the building embodies the best ideas in laboratory construction. To what we







have gathered from other sources a number of original features have been added.

The main lecture-room is on the first floor (Room 26). The seats are arranged amphitheater-like. About two hundred can be seated comfortably, and fifty or seventy-five more can be crowded in. Back of the lecture table is a commodious hood, the front of which can be closed by a glass sash, and in which experiments evolving disagreeable or poisonous gases can be performed in full view of the class. When the hood is not in use a blackboard can be drawn down in front of it. The details of the equipment of the lecture tables will not be entered into, and at present are not complete. This lecture-room, while good in most respects, has the drawback of not being sufficiently lighted. This was occasioned by the raising of the seats toward the rear and the consequent shortening of the windows on the east side, but the windows might easily have extended to the floor on that side and thus material addition to the illumination have been secured.

The other classroom (Room 27) is a better lighted room, but the seats are all on the same level. There is no hood in connection with the lecture table, and the latter is smaller than in the main lecture-room but is equipped equally as well.

The main laboratories, those used in the first year of chemistry, are on the second floor, extending the whole length of the east wing of the building. They will accommodate one hundred thirty-eight students at one time. The two partitions consist largely of glass windows, which can be raised or lowered as the circumstances dictate. By means of these and the doors in the aisles the middle laboratory can be used with either of the end ones, the three may be used separately or all of them together. By taking the doors off and raising the windows of the partitions, two adjacent laboratories are put in as perfect and convenient communication as if the partition had no existence. This feature is original with this laboratory. By the side of these three laboratories, and with a door opening into each, is the preparation room in which the apparatus and chemicals used on this floor are stored and the department work in connection with these laboratories performed. The walls of all sides of these laboratories carry ventilating flues, which are connected with hoods in which experiments with disagreeable or poisonous substances are performed. As yet only about one-fourth of these hoods have been constructed because of lack of funds, but the flues are there and contribute to the ventilation of the laboratories.

In the basement the laboratory for more advanced work is located. This accommodates forty-eight students at one time, or twenty-four if they be allowed; as they should, twice as much table space as students in the beginning chemistry. This room is at present equipped but little more than the other laboratories, but in the near future it is expected that apparatus for special operations and analysis will be set up along the north and west sides, and will include steam drying-ovens, extraction apparatus, apparatus for electrolytic analysis, apparatus for the determination of nitrogen, and others too bulky or costly to be provided at each student's place.

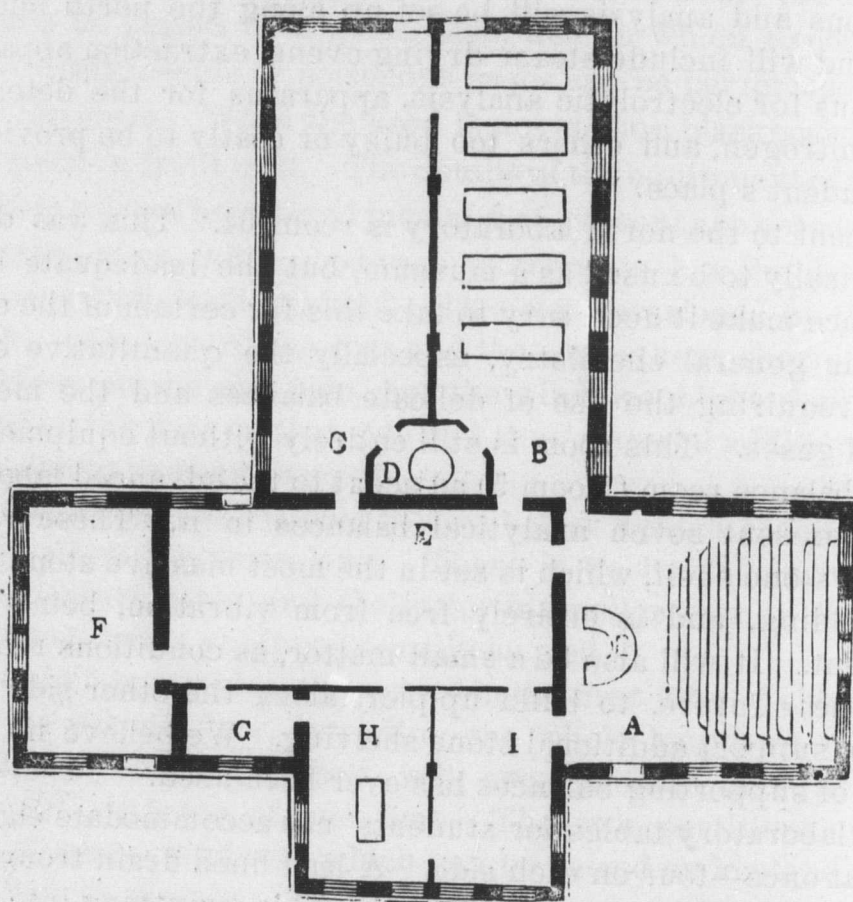
Adjacent to the north laboratory is room 64. This was designed originally to be used as a museum, but the inadequate laboratory space make it necessary to take this for certain of the experiments in general chemistry, especially the quantitative experiments requiring the use of delicate balances and the measurement of gases. This room is still entirely without equipment.

The balance room (Room 5) adjacent to the advanced laboratory has at present seven analytical balances in it. These rest on a heavy stone shelf, which is set in the most massive stone wall in the building, and is entirely free from vibration, being in the basement. It will also be a small matter, as conditions require it in the near future, to build up piers along the other side of the room to support additional stone shelving. We believe no better means of supporting balances has ever been used.

The laboratory tables for students' use accommodate eight students at once—four on each side. A lead-lined drain-trough runs the entire length of the middle of the table, emptying into a large sink at one end. The water-pipes and gas-pipes are installed over this drain-trough and are supported with it by iron braces fastened to the floor. The two halves of the table each side of the trough are joined to it water-tight. Thus a gas and water-supply is directly in front of each student, and a large sink and larger water-supply convenient for use in common by all the students at one table.

The sinks are of cast-iron, fourteen by thirty-two inches and fourteen inches deep, and were made by the Mechanical Department of the College. The drain pipes are protected from obstruction by solid matter by means of a perforated outlet in the sinks. This consists of a one-inch iron pipe screwed in vertically, capped at the top and perforated freely on the side. By this arrangement filter paper or other material which might float over a flat outlet can close only the lower holes, leaving the others free to

carry off drainage. We have found it advantageous to surround this pipe outlet with a cylinder of coarse wire gauze, as otherwise the smaller perforations in the pipe are too frequently clogged. By this arrangement the smallest passage-way in the whole drainage system is in this perforated outlet, and match stumps and

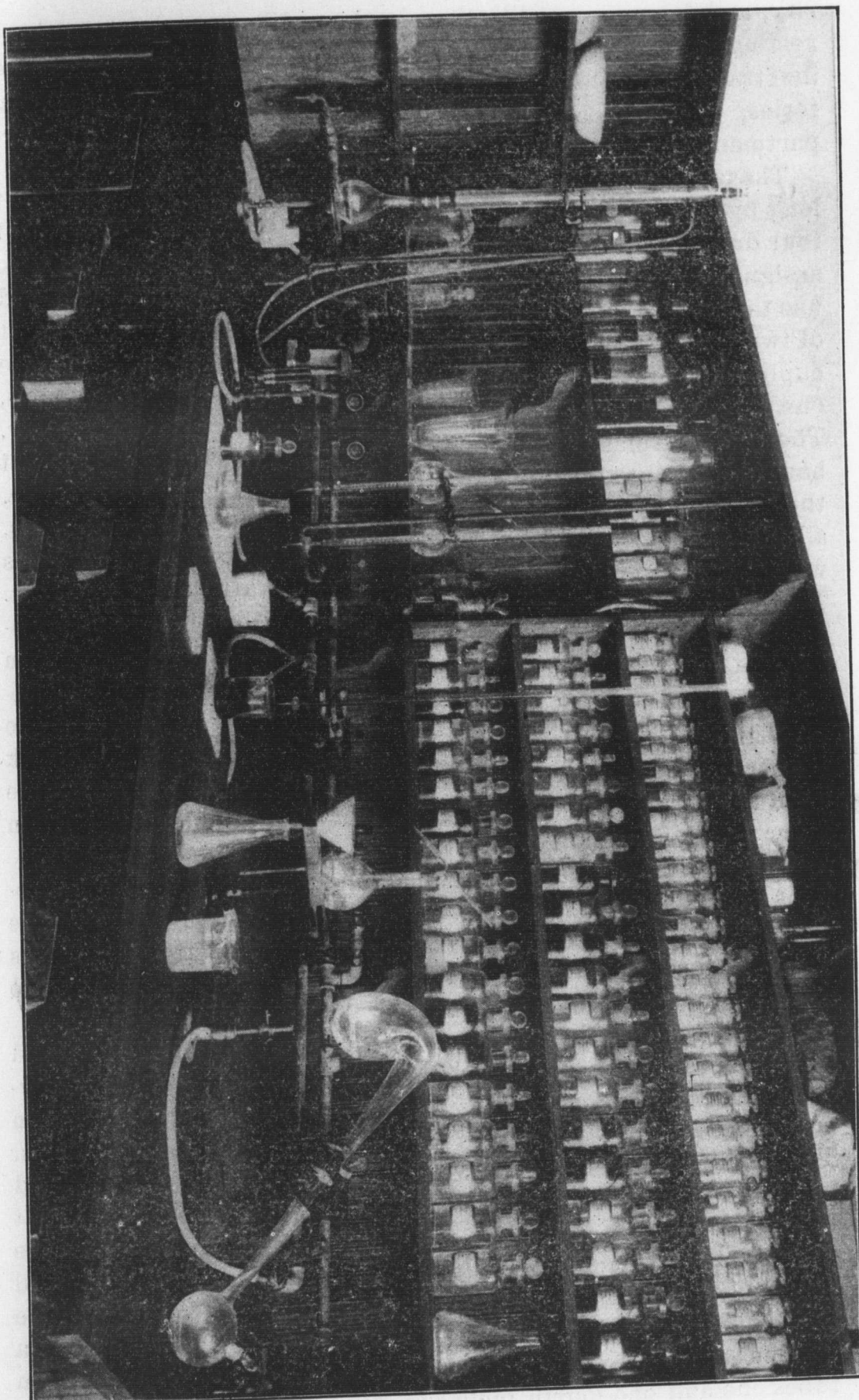


FLOOR PLAN OF THE OLD CHEMISTRY BUILDING.

An old cut which does not show laboratory desks installed later in C and F. At the time of its destruction, A was the lecture-room, B and C the main laboratory, F the laboratory for advanced and Experiment Station work, E the museum, G the balance room, and H and I

other solid material that can pass into this pipe can never lodge farther along. We have thus far had no trouble with this drainage system, and after years of difficulty with others are in a position to appreciate present advantages.

The gas- and water-pipes are utilized as supports for apparatus. By means of a special iron block attachment, extension rings, clamps, funnel supports, etc., can be firmly supported. In this same block, rods can be placed which are first brought forward then upward, thus giving a vertical rod support to which the laboratory equipment can be attached as in the case of the ordinary ring stands. The apparatus is supported in perfect secu-



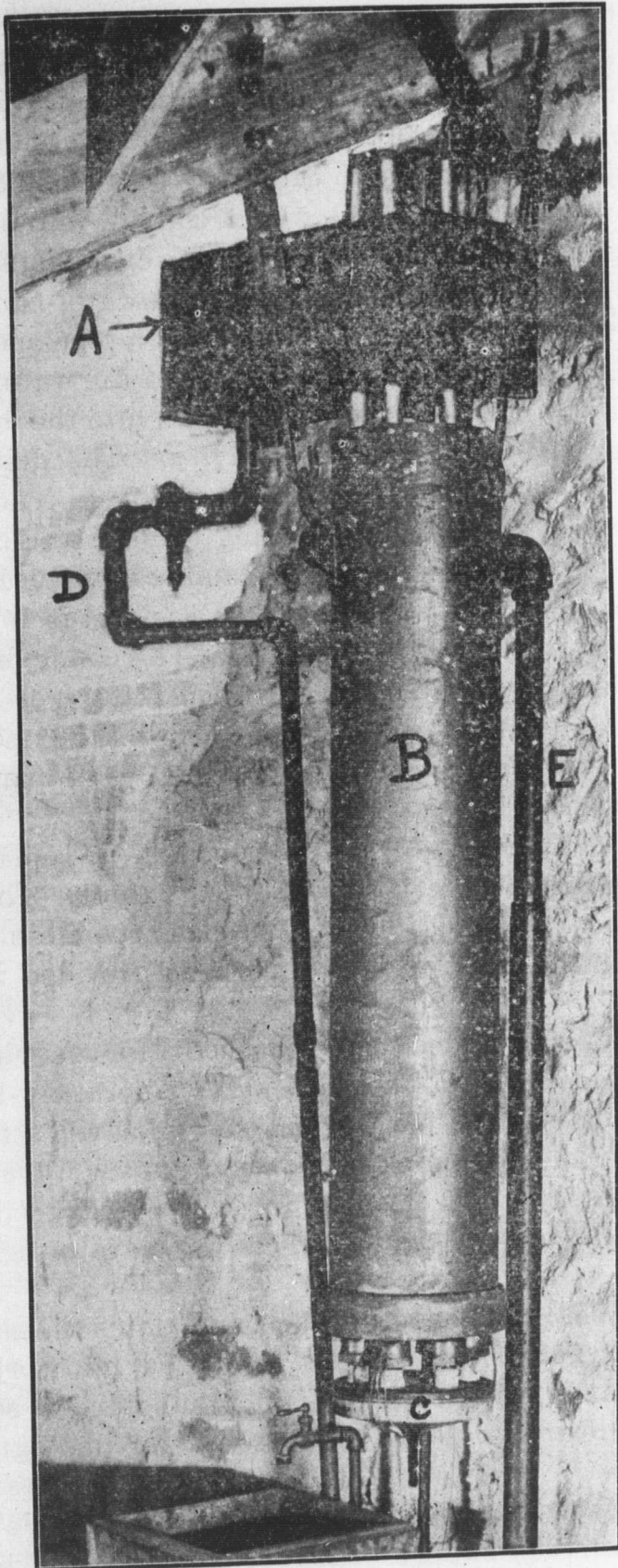
A Private Laboratory, showing utilization of gas- and water-pipes in supporting apparatus.

urity, and far more readily than in the ordinary manner, without resting upon the table top at all. One of the accompanying cuts illustrates this means of support in one of the private laboratories, and the same system is employed throughout the department.

The table space assigned to each student is three and one-half feet long by twenty-seven inches deep, under which is a cupboard and four drawers. In case of necessity, two of these drawers can be assigned to one student and two to another, but the two would use the cupboard in common. By inside arrangements, each set of two drawers may be locked separately from the other set. The cupboard door is fastened by a high-grade lock with duplicate keys, one of which can be issued to each of two students if necessary. The locks are master-keyed so that the officers of the department have convenient access to any place at any time. When not in use, the reagent bottles are put away in the cupboard or drawers, all other apparatus issued to the individual student. In this way the laboratory is kept neat and the apparatus free from dust. There is as yet no shelving above the tables, but if found necessary this can be added at any time. The reagent bottles stand in supports made by boring holes nearly through a one and one-fourth inch board, the diameter of the hole being large enough to allow the bottle to stand in it as in a socket. Two of these block supports hold twenty-four four-ounce reagent bottles and enable them to be transferred from the drawer to the table and kept in order with a minimum of trouble.

There being no gas-works in Manhattan, the department obtains its gas supply from gasoline. A combination gas machine and carburetter, with an automatic mixing regulator, furnishes an almost uniform quality of gas, superior in some respects to coal gas, though more expensive.

The laboratories are furnished with an ample supply of distilled water, piped from a tank having a capacity of one hundred twenty-five gallons. The reservoir is of copper, doubly coated, with tin on the inside, and the water is conveyed through block tin pipes. The distilled water is prepared by condensing live steam obtained from the power boiler of the Heat and Power Department. It is liquefied by a condenser of special design devised by the writer and constructed by the Mechanical Department and a local tinner. A view of this condenser accompanies this article. The head of the condenser, A, is of tin-lined copper surrounded by a wooden box. Through one end of this box pass six block tin tubes one and one-fourth inches in internal diameter. These are



Condenser for Preparing Distilled Water.

closed at the top by corks and pass downward through the condenser, B, which is kept filled with cold water. Within the head, A, there are openings into each of the block tin tubes. Steam is admitted by the pipe, D. Between the point of inlet and the block tin condensing tubes there are twelve partitions of fine brass wire gauze, the object of which is to catch any particles of water that may accompany the steam and would convey impurities. The openings from the steam pipe and into the condensing pipes are all in the upper part of the head, and any water caught or condensed in the head is drawn off from A by a pipe opening at the bottom of A and dipping below the surface of the water in the condenser, B. The water for condensing flows into the bottom of B under pressure and flows out by gravity. The distilled water condensed in the block tin pipes is collected by a broad funnel, C, and carried to the storage tank. Being large, straight and open at both ends, the pipes can be easily examined and cleaned if occasion should ever require it. The whole apparatus is suspended from the rafters of the roof in the attic. The condenser will produce about thirty-five gallons of distilled water per hour. The quality of the water is excellent, and, though the condenser cost only about \$70, it is more efficient than the best apparatus on the market costing five times as much.

The department has not yet found means to replace its museums of illustrative material to any great extent. The plan is to install them in cases along the walls of class rooms in which they are used and in the halls, space having been provided with this in view.

A large room is provided in the basement for assaying, but this is not yet equipped. There is also a small laboratory for elementary organic analysis and for gas analysis which will soon be equipped for use. The building is provided with a shaft from the basement to the attic for an elevator for conveying goods between storage rooms on the several floors, but the elevator is not yet installed.

The dark room in the basement accommodates the gas machine, storage battery, acids, etc., and is also used for work with the spectroscope and polariscope and upon substances sensitive to light. When desirable it can also be used for photographic purposes.

The attic is well lighted and considerable use is made of it. The reserve and surplus supply of Experiment Station bulletins is stored there, one room being used for mailing bulletins in response to special requests, many of which are received daily.

The quarters for the Experiment Station deserve special mention. In addition to an office, storeroom and balance room, there is a room for sampling materials for analysis and preparing and storing samples, and a commodious laboratory. In this laboratory the hood bottoms and table tops are of soap-stone. There is a large fire-proof hood capable of resisting the shock of an explosion. This is for operations requiring the use of ether or other dangerously combustible substances. It is built so as to include one of the outside windows, which is expected to yield in the event of an explosion, and before which apparatus can be set up in which a better illumination of an operation in the hood is desirable. Another hood is reserved for Kjeldahl digestions, and there is one for miscellaneous operations. A fire-proof vault opens off the office and is designed for the safe-keeping of records or specially valuable apparatus.

The building is heated by steam from the central power plant, partly by means of radiators in the halls and rooms and partly by air warmed by being drawn over a series of coils in the fan room. The fan forces the heated air into a T-shaped reservoir or plenum lying under rooms 5, 6, 7, 14 and 15 and the main hall of the basement. From the plenum the heated air is admitted to the flues, built into thick walls as shown in the cut of the basement floor. These flues open into the principal laboratories and class rooms of the building. As the air is forced into the laboratories a corresponding amount is forced out through the flues connected with the hoods. In this way additional draft is provided in them. Each hood-flue is carried independently to the top of a chimney. These chimneys are shown in the cut of the building accompanying this article.

The new Chemical Department has nearly three times the floor space of the old, and the attic besides; it has laboratory desks for over twice as many students without double use of places; it has ample offices and private laboratories for its officers, features almost completely lacking in the old building; its inventory now somewhat exceeds that of 1899, though the museums and cases for them which made so large a part of the latter have not been replaced as yet; equipment as provided is up-to-date, usually the best of its kind, always as good as need be; so, while much is yet to be planned, and much already planned awaits funds for its execution, the department is far in advance of what it has been at any previous date, and is believed to compare favorably with that of any similar institution.

J. T. WILLARD.

LOCAL NOTES.

President Nichols attended the May meeting of the State Board of Education, at Topeka, last Wednesday and Thursday.

Prof. W. A. McKeever will give the commencement address to the graduating class of the St. Marys high school on May 28.

Professor Willard has sent some fine samples of sorghum sugar, melada and syrup to Saint Louis, where they will be part of the exhibit of the sugar industry of the United States at the Louisiana Purchase Exposition.

Arrangements are being perfected to hold a Summer School of Domestic Science during vacation, a large number of applications for such work having been received. We may be able to publish details of the plans, now under consideration, in the next INDUSTRIALIST.

Prof. O. Erf came from St. Louis Friday of last week to look over the status of his department till Monday, when he left again for his work at the great exposition. He reports the fair as a chaotic collection of boxes, bags and crates that are being unpacked. Nothing seems to be in place and finished, as yet, though heroic work is being done everywhere. He thinks that in two or three weeks things will look all right.

STAND UP FOR KANSAS.—It has been stated in the papers that the Haskell Indian band is the only band in the State playing in international pitch and is, therefore, the only one which will be permitted to play at the big St. Louis fair. The statement is not true and is doing an injustice to the best college band in the West, the Agricultural College band of Manhattan, which has filed an application for an engagement at the big fair. The membership of this band is drawn from a student body of over 1500—nearly all Kansas boys. For this occasion the alumni for years past will be drawn on for the best musical talent. Some of these alumni are now music teachers or leaders of bands. Aside from the fact that this band furnishes very fine music, there is another reason why it is entitled to the honor of representing Kansas. It is a Kansas band, consisting of Kansas boys, representing a Kansas college and supported by Kansas money. The Haskell band does not represent Kansas any more than the Ft. Riley military band. Haskell is a United States government school, attended by Indians from every part of the United States. These Indians are wards of the nation. Their food and clothing are paid for by Uncle Sam. Their uniforms and musical instruments are government property, and their teacher is hired and paid by the government. It is not a representative Kansas band in any sense and should not come in competition with the Agricultural College band. If it is desired to have it at St. Louis, it should go as a government exhibit and not as a Kansas product. It seems that the band question is still before the commissioners, and we hope that every Kansas editor will push and pull for the Agricultural College band.—*Le Roy Reporter*.

Historical Society

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NO. 29

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No. 29

SOME ASPECTS OF SOCIAL SENSITIVENESS.

THE most casual observation will convince one that people of all ages are more or less sensitive to the presence of others. The mere child, after arriving at the age of discrimination between persons and things, will indicate this fact by means of some kind of conduct that is relative to others present. It may be a mere look of satisfaction or approval, or it may be a burst of laughter, or a cry of fear. Grown up people may be observed to indicate this awareness of the presence of others in scores of ways that are merely modifications or refinements of the more primitive, instinctive forms.

Significant as these facts are with reference to any given situation, a closer observation will show, I hope to prove, that these various modes of response to other presences have a far deeper significance in determining the future conduct of the individual.

This sense of other selves seems really to be a deep-seated characteristic of the human race. Moreover, it is not a difficult matter to discover manifestations of it in the case of some animal of the lower order. It is a race instinct which has at least a kindred characteristic in all the animal species that tend to gregariousness. In an interesting experiment with dogs, for instance, I have been convinced that an ordinary mongrel may be seen to manifest no fewer than five distinct attitudes toward those of his kind. Let the series range all the way from an innocent, playful puppy to a burly, ill-tempered bull-dog; and, especially after he has become acquainted with them, each one will draw out from him a different expression of mood. This fact will be indicated plainly to the close observer by the "pose" of the mongrel, *i. e.*, by the position and arrangement of the ears, tail, nose, mouth, eyes, back, hair, etc.*

But it is my purpose to treat this subject with more especial re-

* See Darwin, *Expression of Emotion in Men and Animals*.

ference to the human species. Many of the various forms of social sensitiveness probably had their origin in one common utilitarian instinct, namely, fear.* The instinct to run away from danger helped to preserve the species. As the dangers from without grew less and social bonds within were strengthened, it is only natural that this instinct should differentiate into some refined modifications such as bashfulness, shame, and the other forms of embarrassment, which, if not utilitarian in the most vital sense, are at least advantageous in a social sense.

A further word may be necessary on the last point above. Take the case of wooing among men. It seems to be instinctive in the male to press his suit vigorously, and in the female to show disposition to run away. Among primitive tribes, the male was expected to secure his mate by the most strenuous means, even at the hazard of his life, and the female was expected to strive just as hard to escape, until captured, and then to submit willingly. Such a method of courting, in fact, seems to have become an unwritten law among many of the primitive tribes, and such is the method practiced to-day among certain uncivilized peoples. So the sentiment, "Faint heart never won fair lady," pervades the social fabric of the present. As these attitudes of the two sexes respectively, can be shown to have been an aid in the preservation of the species in primitive times, so do their modifications serve a useful purpose to-day.

It is said that the young woman who forgets how to blush loses one of the most valuable charms. I believe that her chances of matrimony are much lessened. The various expressions of gallantry in men and those of modesty in women serve to increase their chances of marriage, and thereby of reproducing their kind. Observe then, *e. g.*, the utilitarian nature of blushing, which cannot be feigned, and which is therefore a mark of genuine sincerity of feeling. I believe that the union of bashful young couples is hastened on account of the very fact that their embarrassment gives mutual impressions of sincere regard, while the debonair conduct of the "highly cultured" pair tends to the opposite effect, on account of mutual impressions of insincerity. So much for social sensitiveness in "love, courtship, and marriage."

While this sense of other presences undoubtedly develops very early in life, its outcome and effect upon the more mature char-

*Baldwin, *Social and Ethical Interpretations*, p. 202.

acter may take on a variety of forms. Some children, who are brought up in a densely populated part of the city, and who are constantly mingling with many strangers, are blasé at five. I believe that this is a serious state of affairs, and a further explanation of the fact that the country youth* has a better equipment for success in life, as a rule, than the city lad, as I shall try to show.

In the first place, fear is a powerful emotional stimulant, as are its refined modifications, bashfulness, timidity, and the like. The youth that feels timidity or embarrassment will act with corresponding force and effectiveness. His movements may be paralyzed temporarily; but, if so, there will be a reaction later that will deepen his reflective experiences and lead him *to do something decisive*.

The isolated country youth is late to develop socially, but this very fact proves advantageous to him. When he comes into the social gathering, say a party once a fortnight, he is green and awkward. Emotions stir his soul to the very depths. He stumbles and falters and blushes and perspires. The period of childish embarrassment has lingered so long with him that nothing short of a long-continued, soul-stirring experience will subdue it and turn it to his better account. He is not only temporarily wrought up, but he also *lives the experience over in memory during the subsequent hours* of isolation, during which he undergoes "deep yearnings for the unattainable," and forms many secret resolutions that make for better character and nobler worth. Here is the battle ground of his most telling victories for the future. He "fights many an inner fight" and goes to the next social gathering with renewed confidence but perhaps to suffer only a less degree of agony.

It is needless to say that during all this time, both in society and out, this typical swain experiences vigorous exercises of many of the bodily functions.† The blood flows faster, the heart beats quicker, there being occasional palpitations, and other of the life processes are accelerated.

But what of the blasé youth? The noises in the street, the runnings to and fro, the multitude of human gazes, both strange and familiar have played upon his tender sensibilities till he is no longer emotionally responsive. Nothing short of a high-keyed

*See Lombroso, *The Man of Genius*, pt. II, ch. 5.

†See Darwin, *Expression*, etc., p. 324. For origin of this sensation, see p. 326 of same.

orchestra playing vivacious strains, or a dazzling circus procession, or a brilliant pyrotechnic display, will ever touch him again. It is most lamentable, but he has lost his various modes of social sensitiveness—real virtues that *ought to have stayed with him till the reflective period* was reached in order to regenerate and refine his thinking.

Having now touched upon the origin and practical value of certain forms of social sensitiveness, let us examine at closer range some phases of the struggle of the youth "of greener sort" to overcome these manifestations. What I desire to emphasize more fully here is a fact that has been too much in the background heretofore, namely, the great value, in character building, of this social sensitiveness to the individual who is in what might be called the later formative period—provided these various modes of emotional experience have been preserved in him to that time.

While all forms of emotional response to other presences are no doubt accompanied by a good deal of self-consciousness, I believe that the reflective period that follows is the one of greatest consequence to the individual. During the emotional attack, sober initiative is, of course, out of the question.* But when he holds this post-emotional experience up before his calmer judgment, in memory, the true situation is seen and readjustments for another such occasion are made out. Now if the individual is able at this point persistently to image himself in a more ideal relation to that former embarrassing situation, he is in the beginnings of what I consider one of the most fruitful forms of auto-suggestion. Right here is accomplished a great work upon his character building. A concrete illustration will make this clearer.

Suppose an extremely bashful young man suddenly, at a party, thrown into the company of a young woman, who, to him, has a "peculiar presence." At once there are terrible surgings to and fro of his life blood. Palpitations and stoppages of the storm center, the heart, alternate. He is hot and cold by turns, and shortly afterwards carries himself off the scene limp as a reed and bathed in a cold perspiration. During the second sober thought that follows his recovery, this verdant youth fights many a fearful foe within his own breast; and, if he is going to be saved at all, wins in imagination as many victories.

The experience of merely beginning business is analogous to

*Darwin, Expression of Emotion, p. 223.

this in the case of many a young man. Some years ago I watched a case of this kind through all the stages of its progress. This young man was trying to establish an agency, and was lacking in both tact and "nerve." His emotional experiences were deep and strong, and his afterthought correspondingly intense. He made many attacks and retreats before any promise of success came. I gave him some mild suggestions at first, and, later, helped him to image himself to better advantage in the trying situation. Still later he was given a more definite lesson in auto-suggestion and I had the pleasure of witnessing his increasing success during a period of half a year.

There is a very marked difference in personalities. Even a little child will give evidence of this fact by his various methods of approaching strangers. While some attract him and win his confidence at once, others repel him. Some people seem to carry a sort of psychic atmosphere with them that impinges upon one's nervous organism. You go into an "august presence" and immediately you feel as if you had a "hang-dog appearance." The lower lip falls, the throat becomes dry, and your utterances are labored and more or less incoherent. The other fellow has you at his mercy, and you both know it. Again, you meet a person of weaker personality and the effect is reversed. As he grows weaker and less positive, you become stronger and more fluent, and sometimes you almost feel keen pleasure in the punishment you are giving him. At another time, you meet one who is on your psychical level and there is a struggle for the mastery with the victory alternating. On still another occasion you come into the presence of one between whose personality and yours there seems to be no conflict. You are both at ease.

Some persons may never experience this form of the sense of other selves in any pronounced way, but I believe that in the end such experience is of positive advantage to the individual for reasons given above, and for others. It may come in the presence of one or of many, in the drawing-room, the lecture-room, or in the form of stage fright. In the ideal case this emotional experience becomes a sort of reformed habit and initiates an inner struggle that leads to higher attainment.

What are some of the aids in this struggle for higher existence?
(1) A merely mechanical one is appropriate clothing.* That is, the

*See *Success*, April, 1904.

subject must not feel that his personal apparel draws out any adverse criticism. (2) A clear conscience. The guilty conscience feels that its condition is revealed, and the psychic power is thereby lessened. (3) Rational self-confidence. And herein is implied practically the whole story. As the first and second points are simple and relatively unimportant, I will pass at once to the third.

Of course it is only necessary to say that imitation is an element in all this readjustment. It is implied in all that I have said about imaging the better situation. The one who simply images himself persistently as overcoming his *sensitiveness*, is practicing what I call unconscious auto-suggestion. Conscious auto-suggestion consists in this same thing, plus the knowledge of the nature and value of this process. Let us see how the matter operates.

It is a well authenticated fact that many persons are able to awake at an unusual hour in the morning, provided they determine to do so before falling to sleep the preceding evening.* Undoubtedly the nervous mechanism is in some way "set" so that it gives the alarm at the proper moment. It has also been pretty well demonstrated that, "by taking thought" before going to sleep, one can prevent the occurrence of a disturbing dream that has been a regular nightly visitor. These are both merely forms of post-suggestion, *i. e.*, suggestions to the self to be worked out in later processes. If these two forms are possible, why not others? If one can arouse himself from sleep at a certain hour by post-suggestion, why can't he arouse his intellect to the solution of other specific problems? I have proved to my own satisfaction a hundred times that he can.

If, for instance, a high-school graduate has, say, to deliver a commencement oration and has forebodings of failure on account of stage fright, he can most likely prevent such a calamity by conscious auto-suggestion. While persistently imaging himself as succeeding most admirably, he must continue to affirm within himself as follows: *I will succeed! I cannot fail! I shall be strong and self-possessed and clear minded!* He must continue this procedure until all thought of failure has vanished and the thought of success has completely possessed him. The remainder is both easy and natural. "As he thinketh, so is he." His success is practically assured.

As a result of the mental and emotional experience related in the

*James, Psychology, vol. I, chap. IX.

last paragraph above, a corresponding change will have taken place in the physical conditions. Instead of pains and quiverings in the region of the solar plexus, the fluttering, enfeebled heart-beat, and the other various constrictions of nerve and muscle (all of which likely accompanied the fear of failure), there is now an opposite condition in the life processes. The heart beats with vigor, the blood flows freely to the parts, and the intellect is clear and keen. In short, there is a full sense of masterfulness that is at once a joy and an inspiration to its possessor.

This one case illustrates the method in them all, whether in business or in social life. This work cannot be accomplished at one trial or in one day, but it must become more and more a rule of practice—a habit of life. The sensitive young person who becomes adept in this mode of procedure becomes day by day more enabled to create the world anew to his own liking.

W. A. MCKEEVER.

TEACHERS' SUMMER SCHOOL OF DOMESTIC SCIENCE AND DOMESTIC ART.

THE course begins Tuesday, May 31, and closes Friday, July 29, 1904. To meet the needs of the public school-teachers of Kansas, a new course has been added to our College work. By the law passed by the legislature last winter authorizing the State Board of Education to give examinations in manual training, the first step was taken toward placing Kansas in the rank of progressive states. Colorado to the west and our neighbor, Missouri, to the east have each placed manual training in their school system, while such states as Massachusetts and New York have given a very considerable prominence to such work for a number of years.

That this line of work should extend not only into all city and county high schools, but into all town and county graded schools where as many as four teachers are employed, there can be no doubt.

This summer's work is planned to give the instruction necessary to fit the teachers to meet the requirements for one-year certificates. The expectation is to extend the work another summer, thus making the complete course include two summers' work, and equip the teacher thoroughly for this line of work in public schools.

This is in no sense a "short course." Though only extending

over nine weeks, the intention is to make both the theoretical work and practical application very intense.

A good general education will be presupposed.

The course is as follows:

Domestic Science.....	15 hours each week.
Domestic Art.....	10 hours each week.
Floriculture.....	5 hours each week.

In Domestic Science the following subjects will be taught:

Fuels.—Sources and economical value of various materials.

Principles of combustion and the correct building of fires.

Ranges.—Their construction, management and care.

Cooking Utensils.—Materials used in their manufacture, and the cleaning and care of the different kinds.

Foods.—Definition and classification, together with the functions of food in the body. In the consideration of each food there will be a discussion of its composition, sources, economical and dietetical value, and its properties when subjected to heat, cold, moisture, and the action of bacteria.

With the study of the carbohydrates the cooking of vegetables cereals and all starchy foods will be taught. The cooking of nitrogenous foods will be illustrated by the preparation of eggs, milk, cheese, meats and legumes in many different ways. The principles of yeast and bread-making will be taught thoroughly. When the subject of fats and oils is reached the lessons will cover the making of salads and pastry, frying in deep fat, and the home manufacture of soap. Special attention will be given to fruits and their preservation, and to cookery for the sick. The planning of menus and dietaries will be accompanied by the preparation and serving of dinners. Especial stress will be laid upon subjects and methods helpful to teachers.

In Domestic Art, the work will be identical with that taught at Pratt Institute, the first part being that which is frequently called "Educational Sewing." This consists of instruction in all the various seams, varieties of stitches, setting of patches and different modes of darning. This work is followed by garment making and pattern drafting.

Hand Work.—Each student will be required to make a book of models covering the full course in hand sewing, and consisting of basting, overhanding, hemming, gathering, patching, darning, joining of lace, etc. Lectures will be given upon the use of each model.

Garment Work.—Use and care of sewing-machine—machine practice. Discussion of appropriate materials. Purchasing, drafting, cutting and making underskirt and drawers. Manufacture of cotton goods.

Drafting and Dressmaking.—Calculate amount and cost of material. Purchase, draft, cut and make an unlined cotton dress. Discuss hygienic and appropriate dress.

The Floriculture is intended to benefit those who teach gardening to children. It will include propagation and culture of flowers, treatment of seeds, preparation of soils, and potting and unpotting of plants.

STATION BULLETINS NOS. 122 AND 123.

The Printing Department has just finished mailing Bulletin No. 122, "Blackleg and Vaccination." Although the mailing list of the Experiment Station contains over twenty thousand names, notwithstanding a recent revision which reduced the number several thousand, the printing of only fifteen thousand six hundred copies was allowed by the printing committee of the executive council. This leaves several thousand unsupplied, including all outside the State and those in the State at post offices from Marysville to Zyba, inclusive, in an alphabetical list of the post-offices. About one thousand copies have been reserved, which will be used in supplying special requests for this bulletin which may be received from those who were not supplied in the regular distribution. This bulletin was gotten out by Doctor Mayo to meet the constant demand for information upon blackleg and its prevention. The following summary concludes the bulletin:

"Blackleg is a germ disease attacking young cattle from two or three weeks to two years old. It occasionally attacks older cattle. The greatest loss occurs between the ages of six and eighteen months of age. Calves that are in a thrifty condition or fat are most likely to contract blackleg, particularly calves that are being fed for baby beef. The greatest losses from blackleg occur during the months of May and June and September and October. The average loss among unvaccinated calves is probably between four and five per cent. Vaccination will reduce this loss to less than four-tenths of one per cent. The younger calves are, the shorter is the period of immunity. Young calves should be vaccinated every four or five months. In vaccinating, the vaccine

should be filtered until it is clear, and care exercised not to inject the vaccine into the flesh, but into the loose tissue just beneath the skin. Calves should not be dehorned or castrated and vaccinated at the same time. The Veterinary Department, Kansas State Agricultural College, Manhattan, Kan., furnishes blackleg vaccine, either single or double, to stockmen of Kansas for one cent per dose, to cover cost of making and distributing. Vaccinating outfits, complete, can be furnished for \$3.50."

The proof of bulletin No. 123, "Crop Experiments in 1903," has been received from the State printer. We are glad to state that the printing committee authorized twenty-five thousand copies of this bulletin.

ST. LOUIS, MO., May 5, 1904.

PROF. E. A. POPENOE,
Kansas State Agricultural College,
Manhattan, Kan.

My Dear Professor Popenoe: Your box of insects has arrived and everything is in good condition. It is surely one of the finest contributions that I have received. I thank you very much for your help in making the contribution a success.

Yours very truly,
C. P. GILLETTE.

The excursion to the St. Louis Exposition is assuming definite shape, even at this early date. A College agent has been appointed, and arrangements for locating the crowd in reputable, reliable places have already been made. Rates have been made with the Union Pacific, which road promises to meet all competition. A ten-day round-trip rate of \$13.30 will be made. It may be less. A day or two after Commencement will probably be the time selected for starting. A circular of information is being prepared, and the public will be duly informed very shortly.—*Students' Herald.*

The Agricultural nine defeated the State Normals at Athletic Park, on April 30, by a score of 5 to 4. The game was well played on both sides. The *Kansas City Journal* says: "This victory gives the Agricultural College the State championship in college baseball thus far this season. Emporia has played five games, winning each, defeating Kansas University, Washburn, and three other colleges. The Agriculturists have not lost a game this season."

THE INDUSTRIALIST.

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Manhattan, Kansas.

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PROF. J. D. WALTERS.....Local Editor
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LOCAL NOTES.

The seniors have challenged the Faculty for a game of baseball.

The interior of the blacksmith-shop has been improved by a coat of white paint.

Professor McKeever went to Salina Saturday to speak at the county teachers' association.

President Nichols is at work on the catalogue for 1903-'04. The "copy" will go to the printer within a few days.

The graduates of Randolph high school came to Manhattan last Tuesday to visit the College and to have their pictures taken.

The College battalion has commenced its annual target practice work. The target range is still at the old place—just south of Bluemont.

The hardest battle on the College athletic field fought this term took place last Friday. The Swedes of Bethany beat our nine by a score of 3 : 0.

Mrs. Henrietta Calvin, Mrs. E. R. Nichols and Mrs. J. T. Willard left last Tuesday for Emporia to attend the State Federation meeting, as delegates from the Domestic Science Club.

The cadet battalion and the College band have received an invitation to participate in the Manhattan G. A. R. memorial exercises on May 30. Memorial day this year will be on Monday.

Contractor Hopper writes from Arkansas City that he will be at the College in a few days to begin work on the new water-supply system. The whole plant will probably be completed by July 4.

At the meeting of the Websters Saturday evening, April 23, Miss Katharine Winter, who so handsomely assisted the society in their play at the Manhattan opera-house, was presented with a "W. S." pin.

The regular College pay-roll for April amounted to \$8016.65. Of this sum the students received \$719.80, the employees \$965.94, and the instructors \$6330.91. The contractor of the new Auditorium received estimates of \$1822.24.

L. A. Salter, '79, and wife, formerly Miss Dora Kinsey, now of Carmen, Okla., write to Professor Walters that they are still representing the *Woods County Press* and that they will visit the World's Fair at St. Louis about May 15.

Last Saturday was Mrs. Wm. Baxter's birthday, and thirty of her Grange friends surprised her by inviting themselves to eat dinner with her. They brought baskets well filled with many delicacies, and a royal feast was an enjoyable part of the very pleasant day.

Some of the boys who are running the College mobile and road grader do not seem to have the "Jumbo" entirely under control at all time. They ran their machine against one of the large gateposts at the main entrance to the campus one day last week.

Miss Ada Rice, of the Department of English, is agent for Hotel Epworth, at St. Louis. The hotel is located within three blocks of the Fair Grounds and is the only permanent brick hotel within walking distance. Applications for rooms should be made before May 15 in order to secure the low rates.

The Perry Brothers, owners of the Manhattan poultry packing house, are building an addition forty by eighty feet to their packing plant. This firm has shipped poultry produce on an average of over one carload a day for many years and is a gold mine to the farmers and poultry men of Manhattan and vicinity.

The Department of Entomology has sent eight cases of specimens to the World's Fair. Six of these are filled with woods exhibiting insect ravages and are accompanied by large drawings of the insects in different stages of development. The other two cases illustrate the work and distribution of the prairie ant.

The frame work and roof of Prof. H. F. Roberts' new house, near the west end of Main street, is nearly completed and reveals a decidedly picturesque outline. The professor has planted the hillside with bushes and evergreens, and has dammed the ravine to produce a small lake. When completed it will be a delightful suburban villa of modern style.

Miss Nettie Wayland and Miss Florence Ritchie, of the senior class, have been engaged to give a series of cooking demonstrations at the Chautauqua at Boulder, Colo. The sessions of the assembly will begin on July 4 and last four weeks. The Colorado Chautauqua has been growing every year since it was organized and has gradually acquired a national reputation. The grounds are located way up on the mountain-side, above the State University, among the pines. They are lighted by electric light and are connected with the city by an electric car-line.

ALUMNI AND FORMER STUDENTS.

Miss Carrie Oneel, '01, is visiting in town for a few weeks.

Adelaide Wilder-Sawdon, '98, is home from Chicago for a visit with her parents and her sister, Mrs. McCullough.

W. C. Moore, '88, has sold his Parsons *Daily Herald* to Henry J. Allen. The *Herald* was established by Mr. Moore about three years ago.

Mark Kirkpatrick, '96, writing from Atoka, I. T., asks for any literature regarding the culture and growth of alfalfa. He is interesting himself in its introduction in that region.

Harriet Nichols-Donohoo, '98, with her husband, will spend ten days at the Exposition at Saint Louis early in May. Later she will make an extended visit with Mr. Donohoo's mother, at Lineville, Iowa.

H. L. Coleman, who was a student in 1892 from Menoken, is now farming near Winfield, Kan. He writes for information concerning cream separators and encloses a subscription to the INDUSTRIALIST.

Miss Daisy Strite, sophomore last year, was married May 4 to Mr. Byron Broom, principal of the Randolph schools. Mr. Broom is to be congratulated and the friends of the young couple unite in good wishes.

Thomas E. Lyon, who received the degree of B. S. from the College in 1893 and that of LL. B. from Michigan University in 1900, was last week elected treasurer of the Springfield, Ill., Y. M. C. A. He enjoys a good law practice in that city.—*Nationalist*.

Miss Eva Buffum, student in 1899, was married on the evening of May 3 to Mr. Fred L. Fritz, of Illinois. Miss Buffum is well known in the State as an evangelist, having held as many as fifteen series of meetings in a single year. Mr. Fritz is a young farmer and stockman. Mr. and Mrs. Fritz will make their home at Rio, Ill., and the best wishes of many friends accompany them.

Mrs. Mabel Fielding-Hutchinson, first-year student in 1895, died at Christ's Hospital, Topeka, from a complication of inflammatory rheumatism and heart disease, April 29. She leaves her husband and a five-year-old son. The funeral on Sunday was largely attended by old friends from out of town. Geo. T. Fielding, jr., '03, of Chicago, was present. The bereaved families have the sympathy of many friends.

Margaretha E. C. Horn, '93, who has been teaching in Western High School, of Detroit, Mich., for the last eight years, and who is now the head of the department of biology there, writes that she is now teaching botany exclusively and has an assistant. She expects to attend the University of Chicago this summer and do work in biology, when her address will be Green Hall. Her Detroit address is 874 Porter street.

Edith Goodwin, '03, after taking special chemistry for two terms, found it necessary to go home this spring. A few days later a vacancy occurred in the Dickinson county high school, and she was elected to fill it. She is now teacher of chemistry and German, with one or two other branches for good measure. While here this year Miss Goodwin assisted with laboratory classes, and this experience will contribute materially to the success which there is every reason to expect her to attain.

T. C. Davis, '91, of Benedict, Kan., has an oil well, and has enlisted the assistance of the Chemical Department in ascertaining the quality of the oil.

H. F. Butterfield, '01, is home for a visit. Since leaving last August he has seen a good deal of country. After working in Nevada with a railroad surveying squad in the fall, he spent the winter in Victoria, B. C., working in a shipyard. Later he was on a farm in the Northwest Territory of Canada. He looks rugged and much improved in health.

F. E. Rader, '95, of the Alaskan Experiment Station, at Sitka, sends some interesting information concerning James F. La Tourette, '77. Mr. La Tourette has been at Sitka for the last two years as an assistant in the Sitka Industrial Training School, which is maintained by the Presbyterian Board of Missions for the education of native children. He maintains a lively interest in the welfare of the College. Mr. Rader adds that Mr. La Tourette is a brother-in-law of Major Cavanaugh.

A. C. Smith, '97, and Mary Waugh-Smith, '99, are pleasantly located at 4717 Cook Avenue, St. Louis, Mo. Mr. Smith has an excellent position for the World's Fair period and they expect to remain in St. Louis until December 1. As they are living near the Fair Grounds and have plenty of room, it is quite likely that persons well known to Mrs. Smith might induce her to take care of them for a limited time while seeing the Fair. If so it will certainly be more pleasant for them than trusting to luck at a strange hotel.

Miss Stella Stewart, '00, writes from Cresheim Hall, Mt. Airy, Philadelphia, Pa., where she is a teacher in the primary department of the Pennsylvania Institute for the Deaf. Miss Stewart thinks the work she is engaged in is the finest in the world and is much pleased with her present position, it being just what she has aimed for from the beginning. While much pleased with the East and city life, she is still loyal to the West, and Kansas in particular. She had a visit recently from Frank Shelton, '99, and much enjoys meeting old College friends.

Walter T. Swingle, '90, physiologist in charge of the laboratory of plant life history in the Department of Agriculture, is the author of bulletin No. 53, just issued by the Bureau of Plant Industry. It is on the date palm and embodies the results of his investigations of the climatic, soil and cultural needs of this tree, which he has studied in the Sahara desert and the southwestern part of this country. It seems that there are a number of localities in this country, especially in southeastern California, where the land and the climate are exceedingly favorable for date culture. This palm, when irrigated, flourishes in a rainless climate with hot desert winds and can withstand great quantities of alkali in the soil. The bulletin is a very interesting one, descriptive, as it is, of the peculiar treatment that the plant requires, and is handsomely illustrated.

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NO. 30

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**KANSAS STATE
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Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

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THE INDUSTRIALIST.

VOL. 30.

MANHATTAN, KAN., MAY 21, 1904.

No. 30

ANALYSES FOR THE PUBLIC.

THERE is a prevailing impression throughout the State that anything that it is possible for a State institution to do may be properly demanded of it by any individual in the State regardless of the real duties of that institution. There being a Chemical Department at this College, requests are being made with great frequency for analyses, some of which would require weeks for their proper execution. The time of the officers is quite fully occupied in the performance of the duties for which they are employed, but, inasmuch as this State has no officer upon whom its citizens may call for analyses that they may wish, it has always been the policy of the department to do everything to accommodate the public that is possible consistent with duties.

Chemical analyses are of two general classes, qualitative and quantitative. In qualitative analyses we merely ascertain what elements or substances are present, regardless of their quantity; in quantitative analyses the amounts of the substances present are ascertained. The latter class of analyses require much more time than the former, in most cases.

We usually make simple qualitative analyses without charge, if there seems to be any purpose that will be served by it. For quantitative analyses, however, a charge is usually made sufficient to cover the cost of the materials and the time of the analyst. We have, however, made many quantitative analyses without charge where the attendant circumstances seemed to warrant it. Such cases would necessarily be those having more than individual private interest. In all cases the head of the department reserves the right to decide what kind of an analysis shall be made, and whether it shall be made gratuitously or not.

It has, unfortunately, been the experience of the writer that most people have no idea of the amount of work involved in chemical analyses, and apparently act upon the principle that such analyses should be made without charge if the curiosity of some

one is thereby satisfied. Within the last few years a number of analyses have been made in testing for poisons. Sometimes the operations were extended over three or four weeks before the final result, and not in a single case now in mind did the person for whom the analysis was made so much as acknowledge the receipt of the report. In only one of these cases was a fee suggested.

The public has an exaggerated idea of the possibilities of chemical analyses, as well as the ease and ability with which these results are obtained. Sometimes a tablespoonful or so of medicine will be sent with a simple request that it be analyzed in order that the inquirer may be able to compound more like it at a less cost. Such results can not be obtained with a complex mixture of organic substances such as many medicines consist of. Requests are often received also in which it is desired that something be analyzed, and that the analyst tell what it is good for in a medicinal way. It is perhaps needless to say that a chemist does not care to become involved in a controversy over the various views of medical men, much less to usurp their field. Analyses of soils, with a view to ascertaining what crops may be grown on the land, or what fertilizers should be applied, are often requested. If such analyses were made they could very seldom serve the purpose for which they were desired. The capacities and the needs of a soil are best ascertained by cropping and by systematic experimentation with fertilizers.

As this article is somewhat in the nature of an announcement it may be concluded by stating that, it being no part of our duty to make chemical analyses for the public, persons desiring analyses made should write concerning the matter before sending the material for analysis. At that time they should state fully the exact object for which the analysis is desired, and give all the information they have concerning the matter. There are so many purposes which chemical analysis of a given specimen may serve that a chemist may work for a number of days making analyses bearing upon some of these, without touching the purpose really in view. Upon receiving this information the correspondent will be informed whether it is possible for us to undertake the work at all, and if so what charge, if any, will be made. It may be added that we are interested in extending our knowledge of the occurrence of minerals in this State, and are always willing to receive and identify such as occur in it.

J. T. WILLARD.

LOCO.

LOCO is a peculiar and interesting disease of horses, cattle and sheep of the Great Plains region, caused by eating plants called loco weeds. There are two plants commonly called loco weeds that are found in this State. The more common plant is the wooly loco, *Astragalus mollissimus*. This plant has rather erect compound leaves, which are covered by a silvery down or pubescence. In early spring the flower stalks bear very dark pink or light purple flowers, which are replaced by small pods bearing the seeds. The other plant is the smooth loco, *Oxytropis Lambertii*, and is found toward the northwestern part of the State. It differs from the wooly loco in the absence of the pubescence or "wool" on the leaves, and has a creamy yellow blossom. The plants are closely related and seem to produce the same effects when eaten.

"Loco" is a Spanish name and signifies foolish or crazy. It is applied to this disease because of the peculiar symptoms exhibited by animals that eat the weed. This disease has been known to stockmen of the Great Plains region as far back as any records of this region can be obtained, but the name loco has often been used indiscriminately to indicate any marked peculiarity of habit or temperament, particularly of horses, although the animals may never have eaten the loco plants at all. The name is sometimes applied to peculiar diseases that are not understood by stockmen and leads to some confusion, but there is a disease called loco that is caused by eating plants, and in some localities and seasons causes serious loss to the live-stock industry.

Animals do not ordinarily eat the loco weeds, but in the first instance have to be starved into eating the plants. This usually occurs when the pasture is short, or after it has dried up in the summer, or during the fall and winter, as the loco plants remain more or less green; animals begin to eat them, and once the habit is acquired they will continue to eat loco weeds even when an abundance of other food is available, often wandering away long distances and doing without water or food for days in searching for the loco weeds. As soon as animals begin to eat the loco weeds they fall away rapidly in flesh and present a dejected appearance generally. Dependant portions of the body often present dropsical swellings, due to a weak circulation, and the animal finally becomes so weak it is unable to get up when down and dies of

general debility. Aside from the general emaciation, the most marked effect of loco weeds is upon the brain. The animal has a peculiar vacant stare and is often unable to comprehend what seem to be simple impressions. Locoed animals walk with a peculiar creeping gait that is recognized by those familiar with the disease, and, in general, it is difficult to get locoed animals to step over a bar a few inches high, and in some instances they will jump a couple of feet high to clear a rope on the ground, or even a shadow across the path. The most characteristic symptom of locoed horses, that the writer has observed, is the difficulty or impossibility of leading them by pulling on a halter or neck rope. Horses that, previous to eating loco, could be led readily will, when locoed, brace themselves or even throw themselves backward when the least force is exerted on the halter. As a rule they can be driven or ridden, but rarely, if ever, led. The general expression and action of the animal indicates a greatly weakened mental power.

The general opinion of stockmen having experience with loco is that one locoed animal in a bunch seems to induce others to eat the weeds also, and that after a horse is well locoed it is practically incurable; although the animal be taken away from the weed and is well fed and cared for, they never recover their normal mental condition, but are foolish, dull and more or less "fitty" when excited by anything unusual.

Analyses of the loco plant have failed to reveal a poisonous or injurious principle; in fact, the composition of the plant shows it has about the same feeding value as alfalfa, as the following analysis by the Chemical Department of this Station shows:

PLANT.	Per cent water.....	Per cent crude protein	Per cent ether extract	Per cent nitrogen free extract.....	Per cent crude fiber...	Per cent ash...
Loco.	6.51	14.73	2.31	40.22	30.39	5.84
Alfalfa, dry.....	8.40	14.30	2.20	31.40	25.00	7.90

In spite of this apparent richness, experience shows that animals will practically starve to death on loco.

In some "Observations Upon Loco" published in 1892, the writer was inclined to the opinion that the loco disease was a result of malnutrition, or a sort of starvation, and later observa-

tions have not altered those conclusions materially. There seems to be some substance in the plant, which the chemists have been unable to find, that injures the brain cells, or else there is an absence of something in the plant which is essential to the proper nutrition of the brain.

In making investigations of loco recently, it was found that quite a similar condition was induced in horses by eating sage brush, *Artemisia*, except that the brain symptoms are not prominent. Horses when starved will eat the sage, fall away rapidly in flesh, get weak in the back and unable to get about, but the general opinion is that if they are carefully fed they will recover entirely, which does not seem to be true of loco.

The Veterinary Department shipped two locoed horses from Liberal, Kan., this spring. One, a two-year-old colt, died upon its arrival; the other, a well broken, gentle mare, about twelve years old, seems to be a rather typical case of severe loco. Because of her melancholy disposition, she has been named Ophelia. An attempt will be made to "feed the loco out of her." If this doesn't succeed, a course of medical treatment will be given.

N. S. MAYO.

A PIPE-ORGAN AS A MEMORIAL.

Ladies and Gentlemen of the Alumni:

I was very much pleased to receive a copy of the circular letter addressed to the alumni of the Kansas State Agricultural College in behalf of placing in our new Auditorium something that would be a tribute to the memory of our late president, Dr. George T. Fairchild.

I am not a member of the Alumni Association, and perhaps have no right to suggest anything in reference to the matter; however, your first proposition—the placing of a pipe organ in the new Auditorium—appeals so strongly and favorably to me, as the director of music in the College, that I cannot refrain from expressing my hearty approval of your plan, and do not hesitate to promise the enthusiastic coöperation of all connected with the department.

My long and intimate acquaintance with Doctor Fairchild and family enables me to give many reasons why it would seem that a pipe-organ—a thing of beauty and useful as well—would be a peculiarly fitting and appropriate memorial with which to com-

memorate our regard for him personally and our appreciation for the large work he has done for the College.

If you will pardon a bit of personal history, I will give a few incidents connected with the past which will clearly indicate that a pipe-organ would most likely be Doctor Fairchild's own choice, if it were possible for him to choose, and would be the one most highly appreciated by his family and friends who knew him best.

In our boyhood days we were schoolmates in Oberlin College. His brother Henry was the principal of the preparatory department and made out my first assignment to classes. His brother James, professor of logic and rhetoric, was the next-door neighbor to George N. Allen, professor of music, with whom I soon became intimately associated and through whose influence I was soon elected leader of the Oberlin Cornet Band, the College Orchestra, and appointed the professor's assistant in teaching the vocal classes of the college.

It was in the latter relation I first met George T. Fairchild, when he joined one of my singing classes, and about the same time entered a violin class taught by my brother. Thus you may see that he was early musically inclined and was always interested in it. Many will remember his "Johnny Schmoker" and violin playing. Later he became a member of the Oberlin Choral Union, a musical organization of over two hundred voices, with a pipe-organ and large orchestra of stringed and wind instruments.

When a sophomore, I left the college, enlisted in the Seventh Ohio regiment of infantry and went to the front. The next time we met was at the Michigan State Agricultural College, where he was connected with the institution, and I was professor of music in Olivet College, Michigan. We renewed our past acquaintance and frequently met, socially and otherwise, at his own home and the home of his brother-in-law, Doctor Kedzie, who for a time taught chemistry at our College.

After leaving Olivet and accepting the chair of music at Drury College, Springfield, Mo., for six years we knew but little of each other. During the summer of 1886 we met in Topeka, when in an interview he told me that they were in need of a director of music in the Kansas State Agricultural College and requested me to run up to Manhattan and look over the field. I did so, was pleased

with the outlook, so reported to him, and was soon elected to the chair of music.

I well remember the first time we entered the chapel together, and upon going on to the platform, turning to him and pointing to the rear, I said: "Mr. President, you have here an admirable place for a pipe-organ." He turned to me and said, in a very pleasant voice: "Yes, and we hope to have one some time, with many other good things." At the beginning of the spring term, when I was planning for the music for my first Commencement here, I conferred with him as to the kind of music he wished for Commencement Day and week. He said: "O, anything you may like. Mrs. Fairchild and I like a large chorus of voices." A chorus was soon organized, raised seats were placed near the platform to accommodate the singers, which in a few years numbered over one hundred fifty voices.

I also well remember that it was customary for the President, after Commencement, to say: "Well, Professor, you have given us some excellent music during the week," and Mrs. Fairchild, when present, would invariably chime in: "Yes; oh, I do love those grand choruses—they remind me so much of Oberlin."

I have said thus much, without which I could not easily present the facts to indicate that if the President and Mrs. Fairchild were both living to-day and the question were asked, Shall we have a pipe-organ for our new Auditorium? I think their answer would be, Yes, by all means, get one, for it will be so helpful in the choruses and so much the more remind us of Oberlin.

My peculiar relations to the Musical Department—the one most affected by your decision—my long and intimate acquaintance and association with Doctor Fairchild, the Christian gentleman, constitute a sufficient reason for stating my personal appreciation of your worthy undertaking, and is an ample apology, I trust, for expressing with ardor and emphasis that the pipe-organ, suggested by the committee, is my first, last and only choice.

In the above statement I think that I am voicing the preference not only of all who are at present connected with the Musical Department, but of the hundreds who have been connected with it in the past, and the many hundreds more who have enjoyed the work of the department and who value its usefulness in the College.

As the ex-students now number over eleven thousand, including the alumni, I would suggest that all of these and other friends of ex-President Fairchild and the College be permitted to contribute to this object. In this way, sufficient funds will be quickly raised, we hope, to purchase an instrument worthy the place and the occasion, first class in every respect, capable of meeting not only our present needs but the requirements of the future, and whose mellow musical tones would daily remind us of the pleasant voice of the one who for so many long years, from chapel platform advised, cheered and inspired so many to nobler thoughts and worthier deeds.

Fraternally yours,

A. B. BROWN.

THE PROPOSED FAIRCHILD MEMORIAL.

The following communication, which explains itself, has been received from Mr. C. L. Marlatt:

A meeting of the Washington Alumni of the Kansas State Agricultural College was held Tuesday evening, May 10, for the discussion of the memorial project described in THE INDUSTRIALIST of April 30. At this meeting, after some general discussion, the following memorial plan was suggested and met with general favor and unanimous adoption. This suggestion is that the alumni body take it upon itself to begin the establishment of a gallery of portraits, in oil, of distinguished presidents and professors of the College, and of graduates who may have achieved distinction in after life, or any others who have been notably connected with the institution.

It is urged that these portraits be kept to a high standard and to become thus an actual art exhibit. It is suggested that a committee be appointed to secure the portraits and take charge of the funds, investing any unexpended portion, and that this committee be instructed to maintain a high quality of work; in other words, not to accept portraits of indifferent artistic merit. Furthermore, it should be provided that no individual is to be thus honored except by a majority vote of the alumni. It is recommended that the College authorities be asked to assign for this gallery proper location or wall space which shall be under the absolute control of the alumni.

Good portraits could undoubtedly be secured of the three deceased presidents. An excellent portrait now exists of President

Fairchild, at Berea, which is very satisfactory to all of President Fairchild's family and friends who have seen it, and this portrait could be duplicated by the artist, who knew Mr. Fairchild very well and who has also painted very satisfactory likenesses of two of Mr. Fairchild's brothers. It is believed that three excellent portraits could be secured at a cost not to exceed \$1,500, including handsome frames.

It was suggested that the first portrait to be secured should be that of President Fairchild. It was held that the alumni could not do better than to start a gallery of portraits as indicated, which would grow in historical value and interest with time, and to which additions could be made at intervals.

There is no feature of greater interest to the visitor to the older institutions of this country than the collections of portraits which have been slowly accumulated of distinguished men who have been connected with these institutions. This is true of Harvard, and Yale, and Brown, and other eastern institutions, and is also true of great institutions of learning abroad. Such a portrait gallery in the hall of the College would be a memorial in a true sense, and would perpetuate the individuals honored in a much more satisfactory way than anything of mere temporary utility. It would also be a much broader idea when the possibilities of growth and additions are considered.

EXPERIMENT STATION BULLETINS.

The following article from the *Kansas Farmer* will explain to some of our farmer friends why it is that the Agricultural College is not more liberal and timely with its Experiment Station literature.

"Please place my name on the bulletin list. I would like a recently published bulletin on oats.—*Jno. Elmer, Rooks county.*"

Professor Willard has placed your name on the mailing list and you will receive the bulletins as issued by this Station, if enough are issued to supply the number included in the list. More than twenty-five thousand names, mostly Kansas farmers, are included on the list at present. By order of the State publication committee, only fifteen thousand copies were printed of each of the last two bulletins, thus ten thousand Kansas farmers have to go without their copies. The bulletin on "Crop Experiments" has not

The agricultural colleges and experiment stations are often called upon to make authenticated tests of dairy cows for which advanced registry is desired on the basis of superior yields of butter. Mr. J. B. Griffing, of the senior class, as a representative of the Dairy and Animal Husbandry Department, recently supervised some tests of several Holstein cows for Mr. H. B. Cowles, of Topeka. A seven-day test was made and three were found eligible to advanced registry.

ALUMNI AND FORMER STUDENTS.

Mrs. Emma Miller-Cook, '01, is now at her old home, near Milford, Kan.

Among recent visitors at the College were Frank Shelton, '99, H. D. Orr, '99, and Adelaide Strite, '01.

Jas. Correll, '03, has a position as electrical engineer in the Palace of Agriculture building at the Louisiana Purchase Exposition.

Maude Sauble Rogler, '01, and little daughter, and Mattie Sauble, sophomore in 1902, recently visited the College and friends in town.

May Bowen-Schoonover, '96, of Morgan Park, Ill., arrived last week to spend the summer with her mother, Emma Haines-Bowen, '67.

Dr. J. W. Evans, '94, after taking a short course in graduate surgery in Chicago, returned to Kansas and located at Council Grove.—*Jayhawker*.

Dr. Paul H. Fairchild, '86, is now president of the Pulvola Chemical Company, 160 Williams Street, New York City. The company manufactures an extensive line of medicinal toilet preparations.

R. K. Farrar, '96, with Mrs. Farrar, visited the College this week. Mr. Farrar is superintendent of the schools at Downs, Kan. Though he was here two years ago, he finds things changed very much.

F. E. Johnson, '99, who was recently graduated from the Kansas City Veterinary College, has been appointed government meat inspector at a salary of \$1200 a year. He has been assigned to work in Chicago.—*Students' Herald*.

Otho True, '99, and Miss Pearl Turner, sophomore in '99, were married, May 11, at the home of the bride's sister, Mrs. J. R. McKeever, in Topeka. After a trip to St. Louis, Mr. and Mrs. True will be at home near Vera, Kan.—*Students' Herald*.

Hope Brady, '98, is again at home for the summer, having completed another year of teaching in Liberal, Kan., schools. She spent a few days visiting in Oklahoma before coming home, and among those visited was Miss Della Wilson, freshman in 1901.

P. S. Creager, '91, telegraph editor of the *Kansas City Journal*, spoke before the Economic Conference and the class in journalism at the University of Kansas, May 12, on "How a State Paper Covers Local News Fields." The lecture is one of a series on journalism.

W. L. Hall, '98, assistant forester, United States Department of Agriculture, spent a few days in town recently, and delivered an address before the Horticultural Society, Saturday afternoon, May 7. He also addressed the State Horticultural Society, at Dodge City, last week.

O. H. Elling, '01, surprised many of his friends by slipping away from the Hays Experiment Station and being married, April 9, to Miss Poole, a school-teacher near Lawton, I. T. Mr. Elling thought an experiment station in domestic science would go nicely with his station work.—*Jayhawker*.

Alexis J. Reed, '03, made a short visit to the College and friends in town, and on Wednesday, May 18, was married to Miss Laura Paulsen. The young people have many friends who wish them the fullest realization of their joyous anticipations. They will live in Chicago, Ill., Mr. Reed having a position with the Western Electrical Company.

Atty. W. E. Smith, '93, of Kansas City, Mo., and Miss Caroline Wynne, of Gallatin, Mo., were married at the home of the bride's parents May 11, 1904. The groom is a son of Mrs. Irene Johnson, of this city. Mr. Smith's many Manhattan friends extend congratulations and best wishes to him and his bride. They will make their home in Kansas City.—*Nationalist*.

H. W. Jones, '88, has been elected to the principalship of the Branner school, Topeka, Kan. This is the pioneer manual training school of that city and the largest of the Ward schools. Mr. Jones' training at an industrial institution counted in securing this position, which carries with it a considerable increase in salary over that he has been receiving as supervisor of vocal music.

Jesse M. Jones, '03, writes from R. F. D. No. 4, Montgomery, Ala., of his great satisfaction in having resigned College work to engage in stock raising. He thinks that is the best country for stock in the United States. It is developing very rapidly on account of its peculiar advantages. Mr. Jones takes keen interest in the changes and improvements on the campus here and expects to see them some time.

R. G. Lawry, '03, is to be congratulated on a very recent promotion to chief draftsman of the structural steel department of Schaefer & Co., consulting engineers, at 1275 Old Colony Building, Chicago. "This advancement carries with it," Mr. Lawry said, "advantages in every way, besides that of not being under the direction of any one. I cannot visit the old hill this spring, as I had wished, but hope to do so later in the summer or fall."—*Jayhawker*.

E. C. Gasser, junior in 1899 and foreman of the blacksmith-shop for several years, is now instructor in shop work, department of farm mechanics, Iowa State College of Agriculture and Mechanic Arts. He is well pleased with his work there, but has been at this institution too long ever to think any other place quite as good. He thinks that the Iowa institution has more money than ours and the students that attend must have more, also, in order to get along.

At the recent meeting of the Kansas Federation of Women's Clubs at Emporia, Jennie Smith-Strong, '94, of Kinsley, Kan., presented an interesting paper upon "Music and Myths of the American Indian." Mrs. E. R. Nichols was chairman of the Department of Education, and in the program which she provided Prof. Henrietta Willard-Calvin, '86, gave an address upon the Agricultural College, and the discussion of this was led by Lydia Gardiner-Willard, senior in 1884.

E. F. Nichols, '88, professor of physics in Columbia University, has been spending a few days visiting the College and relatives and friends in town. Professor Nichols will spend the next year abroad, most of the time in England studying, but goes to Paris first. Professor Nichols is in charge of the graduate and research work at Columbia University and is leaving for the next year in order to escape the temptations to experimental investigations that interfere with study that he feels he needs.

H. R. Thatcher, '03, writes an interesting letter from Houston, Tex. He says that there is quite a representation of agricultural colleges in that vicinity; Iowa, Illinois, Wisconsin, Texas, Kansas and Indiana students all seem to be doing well at rice culture. He says that every agricultural student there is of the opinion that his College experience was the most valuable training he ever received. The delegation there from this institution has put into practice many ideas gained from College life.

At the meeting of the State Horticultural Society at Dodge City, May 11 and 12, W. L. Hall, '98, assistant forester, United States Department of Agriculture, gave a address on "The Work of the United States Bureau of Forestry in Kansas," and another on "Progress of Forestry in the United States," the latter being illustrated by stereopticon views. R. S. Kellogg, '96, of the Bureau of Forestry, spoke on "Forestry Planting in Western Kansas," and "Woodlot for the Kansas Farmer."

H. D. Orr, '99, has been appointed an interne in St. Luke's Hospital, Chicago. Internships are positions on the resident medical staff of the hospital, and are much sought. There were seven places to be filled in this case and over one hundred applicants, among which Mr. Orr ranked third. Mr. Orr receives his M. D. degree June 16, but his service in the hospital begins June 1 and continues for two years. He had previously won a place at Wesley hospital, which he now declines for the better one at St. Luke's.

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♦ ♦ ♦

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No. 31

THE CHOICE OF A THEME, AND THE GATHERING OF MATERIAL FOR AN ORATION.

IN No. 25 of the current volume of the INDUSTRIALIST I discussed the "Parts and Plan of an Oration," and emphasized the importance of the plan to him who would attain success in this type of discourse. In the present article I wish to consider, briefly, the choice of a theme and the methods of gathering material.

I. The Choice of a Theme.

One of the most perplexing problems for the inexperienced speaker is to make a wise choice of a theme.

The young orator sees before him an occasion when he will be expected to make a speech. It may be a commencement oration, or a class day speech, or an address on education, or a speech on some political or social occasion, or a sermon, that is desired.

The first question that he naturally asks himself is, "What shall I speak about?" This question may be substantially answered for him by the occasion itself, or he may be left free to choose, within such limits as are dictated by the canons of good taste. In any case, the question is one of supreme importance. Success or failure will depend largely upon the answer it receives. Of course, every speechmaker must decide for himself what he shall take as the topic of his discourse. If he has a particle of the oratorical instinct, he knows better than any other his own tastes and powers, the themes that stir him most profoundly, the topics with which he is most familiar. Consequently no one can dictate to him as to the choice of a theme. But, while no specific directions can be given as to this matter in any particular case, certain general principles may be laid down, which may always be observed to advantage by him who would be a successful speaker:

1. Perhaps the first qualification that a theme should possess is that it should be *practical*—capable of calling for an action or a

course of action. It should not be a "subject in the air," or in the upper ether of an erratic imagination; it should stand with its feet upon the solid ground of substantial thought or concrete fact or sincere conviction. Those medieval ecclesiastics who disputed as to how many angels could dance at once on the point of a needle, or who argued fiercely as to whether the man, who, while eating an egg, had inadvertently swallowed a prematurely cooked spring chicken, had violated a rule of the church by eating meat on Friday, were hard pressed for a subject. Had they assailed, instead, the corruptions of the contemporary clergy and preached a crusade of reform, they would have had a far more tangible if less agreeable subject of discourse. And that, because it would have been real and practical.

2. In the second place the theme chosen should possess the quality of *originality*. That is, it should be suggested by the speaker's own thinking and reading. Thus, while he may not develop a thought that has not been treated by others, it will be his own thought, treated in his own way, and consequently it will lay hold of him more powerfully and therefore he will take hold of it more effectively than would otherwise be possible. It will stir him with all the enthusiasm of a new discovery, and so he will discuss it with an energy that he could not manifest with regard to a theme toward which he is indifferent or that possesses for him but a languid interest.

3. The preceding remark suggests as a third principle to be regarded in choosing a theme the idea that it should be *attractive to the speaker*. A subject that quickens the intellect, arouses the feelings, stirs the imagination, will be far more fruitful in rugged thinking and eloquent presentation than will another subject, equally good in itself, that is not thus attractive. He that speaks *con amore* may always be trusted to set forth the beauty, or grandeur, or importance of his thought, to the full extent of his powers.

4. Again, the theme should be, so far as may be, *attractive to the audience*. A commonplace subject, at least a commonplace statement of a subject, will almost invariably result in a commonplace speech and in listless attention. Care should therefore be taken that the subject be fresh to the hearers. Thus the stimulus of novelty will be administered to their interest.

5. Still further the theme should, also, be *adapted to the hearers*.

In all his work the orator needs to study the capacities of his audience. A theme that would require an argument suited in thought and style to the Supreme Court of the United States would be entirely inappropriate to a jury of average tradesmen. A topic that demands the closest thought and extended, vigorous discussion is not wisely chosen for a brief address before the infant class of a Sunday school. Nor will his speech receive the greatest favor if the theme be distasteful to the prospective hearers. The wise speaker will consult both their tastes and their capacities. A theme for Fifth Avenue must be somewhat different, or at least must be couched in different language, from that suited to a company of toughs from the Bowery.

6. Likewise, the theme should be *adapted to the speaker* himself. This principle has already been partially implied by the suggestion that the orator should select a theme he likes. It should be suited, in other words, to his tastes as well as to the tastes of his hearers.

But while the theme should be suited to the aesthetic capacities of the speaker, it should be no less carefully adjusted to his *physical* capabilities. A proposition that calls for a half day of vigorous discussion is not well adapted to a sickly speaker with a puny frame and a squeaky voice. Webster was peculiarly fortunate in this respect, as were also Spurgeon and Beecher. These great men stood in the front rank among the orators of the nineteenth century, each without a peer in his particular field. They each chose majestic themes for their discourses. And they discussed those themes with the highest success, partly because each of them was favored with a robust physical nature, capable of great endurance, and with a magnificent organ voice, whose music could be made to reach and sway vast multitudes. Probably no more splendid triumphs of eloquence were ever won than those Mr. Beecher wrested from the reluctant hands of hostile English mobs during our civil war; but it is doubtful if he could ever have gained those brilliant victories had he not possessed a physical nature in harmony with the noble themes he chose. Or, to reverse the statement, he chose themes that he was physically able to handle.

Still more must his proposition be adapted to the speaker *intellectually*. The orator needs to know himself and his powers on the one hand and the demands and capabilities of a proposed

subject on the other, in order to adjust the topic of discourse to the capabilities of his own mind. The precept of Horace still holds:

Examine well, ye Pises, weigh with care
What suits your genius, what your strength will bear.

He who follows this precept will not labor with a theme beyond his strength nor stoop to one beneath it. A pigmy cannot do the work of a Titan, nor should a Titan dawdle over the task of a pigmy. Michael Angelo can do better than make snow images.

Finally, his theme should be adapted to the speaker *morally*. Audiences are justly exacting in this particular. They demand a consistency between the orator and his theme. The *argumentum ad hominem* is with them very far-reaching. A man that has a reputation for penuriousness will not be a very effective speaker on generosity. One of known immorality will not shine very brilliantly as a preacher of the Christian virtues.

II. The Object.

After the orator has settled upon his theme, or proposition, he will find it of advantage to state this proposition in the form of a brief imperative sentence. This statement is, of course, for his own guidance in accumulating material, in formulating his plan, and, indeed, in the entire work of invention. This imperative may be called "The Object."

It has already been shown that the leading characteristic of oratory is persuasion. The speaker must never lose sight of the fact that he aims to induce his hearers to do something, either immediately or mediately. So he really must choose an object instead of a subject for his oration. He is a speaker with a mission. He finds the end of his labor not in the discourse itself, but in his audience.

The object, then, as the ultimate purpose of the oration, is of supreme importance to the orator's success. It should permeate, pervade, dominate the entire discourse, from the first word of the exordium to the last word of the peroration. Its importance demands for the object the most perfect statement conceivable. Experience has shown that the best form is a brief, clear, precise, imperative sentence. Any other form exposes the speaker to the danger of missing the appeal to the will. The student often writes: "My object is to prove——." But you may prove and not *persuade*. He tries again. "Object: To induce my hearers to

believe——.” But they may believe and not *act*. “Devils believe.” Once more. “Object: To induce my hearers to feel——.” But feeling is by no means synonymous with doing. “Well, then—object: To induce my hearers to *do* so and so.” Very well! Why not say, then: “Do so and so?” Instead of writing: “My object is to induce my hearers to oppose unrestricted immigration,” why not write: “Oppose unrestricted immigration?” Such a form is brief and simple, and, more than all, it indicates directly and unmistakably the appeal to the will. So it serves as a rudder to the speaker’s mental action, to hold him steadily to his chosen goal. The imperative is a command, and as such is a bugle-call to thrill and brace, and hold in order the entire discourse.

For the object is really the test of the orator’s work. By it he tries the matter that comes to his hand, and all that will not aid in the furtherance of his purpose he rejects. His object is the mercury which discovers and attracts to itself the gold. In gathering material for his discourse let him ask himself, concerning each item: “Will this further my object?” The answer to this inquiry will determine the usefulness for his present purpose of whatever material he may have at hand. In arranging material, in like manner let the speaker ask himself: “Where will this thought further my object best?” The response to this question will determine the relative position that each chosen item should occupy in the discourse. Still further, the object will determine the relative prominence to be given by the speaker to each item of his material. Let him ask himself, “How important is this thought to the accomplishment of my object?” The answer he gives to the query will denote the emphasis that he should lay upon that thought. Thus he will secure logical perspective, and in the development of his work he will secure, also, literary or oratorical perspective.

Since the “object” is for the speaker’s own guidance, it is usually wise not to state it to an audience. Human nature is so constituted that, if you tell a man that you intend to induce him to do a certain thing or adopt a certain course of life or pursue a particular line of action, you arouse at once his opposition and he mentally says: “Do it if you can,” and shuts his teeth hard in the determination not to be moved. Command him: “Do so and so,” and his pugnacity makes him say to himself and probably to you: “I won’t.” Consequently, it is ordinarily better not to announce the

object, but so to use it as to lead the hearers to act in accordance with its behest without a thought that they are not acting from their own unprompted desires. In those cases where the desired action is revealed at the outset, as in addresses to juries or legislatures, if the position of the orator is formally announced it should be stated as his own attitude, or as the proposition, but not in the form of the object. He may say: "I take this position," or "This is the true attitude," or "We should act thus," or "I appeal to you to do so and so," when it would not do to say "Do this," or "You must do this." To his audience, as it exists in his imagination while preparing his speech, he says: "Do!" To his audience, as it actually exists before him while delivering his speech, he says: "Don't you think it best to do?" "These are the considerations on which I urge you to do." "In view of these facts, what shall we do?"

That is, the orator must use tact and common sense in bringing his audience to his object. Sometimes he will have one professed but quite another real object, and so "take them by guile." Thus Shakspeare makes Marc Antony, in his speech over the dead body of Caesar, say, "If you have tears, prepare to shed them now;" that is, after the introduction, he avows in the body of his speech, as his object, to make his hearers feel the pathos of "great Caesar's fall." His real purpose is revealed after the mob, to whom he has been speaking, rushes off with the frenzied cries: "Revenge! burn! kill!" when he says with great satisfaction: "Now let it work. Mischief, thou art afoot." That is, his avowed object was, "Weep;" his real object, "Riot."

III. How to Gather Material.

After he has settled upon his general theme, and has formulated that theme in an imperative sentence, the first thing to be done by the orator, who has to prepare a speech, is the accumulation of material. There are various processes to be pursued in accomplishing this work.

1. *Thought*.—The first of these processes to be mentioned is *thought*. Was it Richter who said: "Never write till you have thought yourself empty?" By such reflection the maker of a speech will insure an originality of theme and of treatment that otherwise would hardly be possible. There must be some reasons why he has chosen a given subject. Let him write out those reasons in as brief form as possible. What does he know of the sub

ject? What does he think of it—of its relation to truth, to society, to the state, to his prospective audience? Let him write out all his knowledge and thoughts, without special reference to logical arrangement, but in the order in which they occur to him. Neither need any attempt be made in this preliminary work to secure literary qualities. The aim should be, rather, to take notes just full enough to indicate his own knowledge, his own thinking and his own feeling on the subject. If a good illustration, or a happy metaphor, or a felicitous expression flashes before him during this process, as probably it will, let him note it with sufficient fullness to enable him to recall and reproduce it when he returns to examine the products of his thinking after they have become cold. Thus he takes snap shots at the mental visions that flit before him and fixes impressions which he can subsequently develop at his leisure and place in their proper positions in the framework of his plan when completed for use.

This process of rumination aids the speaker in digesting and assimilating his knowledge, makes his thought definite, shows him how much he knows of the subject and, especially, how little he knows. When it is completed, he is ready for the second process in the work of gathering material, namely:

2. *Reading.*—If Richter laid down the maxim: "Never read till you have thought yourself empty," he also said, "Never write till you have read yourself full." How minute and how extensive this reading should be will depend largely upon the nature of the subject. Reading, moreover, that is merely a cramming process will be of little value to the orator. However broad it be, it must be distilled in the alembic of his own mind before he can make its essence his own.

The order of reading should be, usually, first of a general nature, such as cyclopedia articles. These will serve to give a comprehensive understanding of the subject. Then should come review articles and afterwards the treatises and original authorities. It may be said, however, that for strictly oratorical work minute and exhaustive study may not always be an advantage. If it be not thoroughly assimilated, instead of furnishing intellectual and oratorical pabulum it will clog the free operation of the mind and induce mental dyspepsia. Howsoever extensive the reading, it should be, above all things, suggestive and stimulating, setting the speaker's own mind and imagination in motion and

arousing the oratorical spirit to action. No more remarkable illustration of vast and exact learning, made available for oratorical purposes, can be found in the literature of eloquence than is furnished by some of the speeches of Edmund Burke, particularly those on "The Nabob of Arcot's Debts," "The East India Bill," and those on the impeachment of Warren Hastings. But these subjects were exceptional in the nature of their themes as Mr. Burke was himself exceptional among men. He had read, and so every orator should read, broadly enough to cover the ground to be traversed by the speech and thoroughly enough to make him master of the particular phase of the subject to be discussed. Such reading not only increases the speaker's knowledge and supplements his thinking, but modifies or confirms his views by the results of the labors of others. In any case it gives him greater confidence in the correctness of his conclusions and helps him to feel that he speaks "as one having authority," a consciousness which one must always have if he would speak with power.

3. A third important process in the work of gathering material is found in *conversation*. Richter might wisely have added to his aphorism: "Never pronounce your speech till you have talked yourself clear." Discussion is a wonderful clarifier of thought. One does not know how muddy his ideas are till he has passed them through the filter of conversation. Let him, then, who has "thought himself empty" and "read himself full," preparatory to making a speech, talk with some intelligent and sympathetic friend. Even though he talk with one not so well informed as himself, the very effort of conversing on the matter will enable him to deliver his soul, and he will also be in a position to use wisely any suggestions that are offered. So will his thought be made lucid.

CLARK M. BRINK.

The root exhibit from this College at St. Louis is evidently attracting a good deal of attention. Mr. H. H. Kern, the commissioner in charge of state agricultural exhibits, has written to Professor Ten Eyck requesting that a sample of alfalfa roots be sent at once, by express, to St. Louis. The people want to see the root system of alfalfa. The Farm Department had a sample on hand, which was sent last Monday, as requested.—*Students' Herald*.

THE INDUSTRIALIST.

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LOCAL NOTES.

The Regent committee on employes were in session on Tuesday and Wednesday.

Doctor Mayo was called to Independence and Kansas City last Monday to investigate a horse disease.

Prof. W. A. McKeever occupied the pulpit in the first Congregational church in Topeka on Sunday, May 22.

President Nichols went to Topeka Friday to see the State printer concerning the printing of the annual catalogue.

Miss Harriet Howell expects to visit the College and friends here this summer, arriving in time for Commencement.

Asst. G. C. Wheeler has an article in the *Kansas Farmer* describing and illustrating the calf stanchions of the cattle pens at the Agricultural College.

St. Mary's College beat the Agricultural College six to four in a poorly-played seven-inning game in the Manhattan arena last Monday. The game was poorly played by both sides, each making seven errors.

Three wagon loads of preparatory students went to Eureka lake last Saturday afternoon. Boating, supper and a good time generally were reported. The party returned about half past nine o'clock in the evening.—*Students' Herald*.

The Department of Animal Husbandry has purchased a pure-bred Jersey heifer calf of Fred Zimmerman, Moray, Kan. It is the offspring of Mr. Zimmerman's Lorne's Oonan, a very superior cow, which has been in the care of the department for nearly a year.

R. H. Brown, assistant in the Department of Music, has been appointed by the president, Thomas A. Becket, of Philadelphia, an associate delegate from Kansas to attend the next annual convention of the M. T. N. A., to be held in St. Louis, Mo., June 28 to July 1, 1904.

We have received a circular from the Bradley Polytechnic Institute, Peoria, Ill., announcing a summer school of manual training. E. O. Sisson, '86, is the director, and Mrs. E. E. Winchip, formerly superintendent of sewing here, gives the instruction in sewing and dressmaking.

The appearance of the name of Karl F. Kellerman, assistant in physiology in the Bureau of Plant Industry, as one of the authors of bulletin No. 64, on "A Method of Destroying or Preventing the Growth of Algae and Certain Pathogenic Bacteria in Water Supplies," serves to impress the flight of time most strongly upon those who but so recently knew Mr. Kellerman as the small son of Prof. W. A. Kellerman, then professor of botany here. The bulletin referred to is a very interesting one and bears in a most practical way upon the preservation and purification of large bodies of water for city supply.

The Chemical Department has received, among other samples recently sent for analysis, some samples representing three different cases of animals that are supposed to have been poisoned either by eating some poisonous plant or through the malicious act of some one. It is quite impossible for the department to make complete analyses of such specimens, but it endeavors to do the best that circumstances will allow. The need of a public analyst for the State is becoming very pressing. There are many cases where one would be willing to pay for the analysis, but is unable to have it made because of the lack of an officer for this purpose.

The Ionian annual, in the form of a six-act play, "Princess Kiku," at the opera-house Monday and Tuesday evenings, was greeted with crowded houses. The first performance was to invited guests. The Y. W. C. A. received the benefit of the last night's play. The stage decorations were gorgeous and represented a typical Japanese garden. The first number of the special music was rendered by Brown's orchestra. The Ionian society is indebted to Miss Estella Fearon, director of the drill girls, and Miss Gertrude Rhodes, pianist, for their valuable assistance. Also, to Robert Scott, for his effectual assistance as director. The play was well rendered throughout and the Ionian girls are worthy of the highest praise. This will probably be the last annual given in the Manhattan opera house, as the new Auditorium on the College campus will be available next September.

The project of the College Y. M. C. A. to erect a spacious building near the campus, a building worthy its purpose and large enough to meet the many requirements of the association, is gaining momentum. A meeting of the young men of the College, under the auspices of the College Y. M. C. A., was held at the M. E. church, May 22. President Nichols presided and introduced Mr. E. T. Colton, of New York, traveling secretary of the international committee of the Y. M. C. A. Mr. Colton in his speech outlined the need of a substantial Y. M. C. A. building in such an institution as the Kansas State Agricultural College, the good to be derived from such a building, and in closing declared that only by the active work of the young men of the College would the end sought ever be realized. Blank cards were then passed around for pledges from the students present toward the project. About two hundred twenty-five students were present.

From these two \$150 pledges and twenty three \$100 pledges were taken. The remaining pledges ranged between \$5 and \$90. In all \$5678 were pledged. During the week many other pledges were added, and a further canvass will be made of the students, the Faculty, the business men of the town, and the friends of the institution over the State. It is planned to erect a building that will cost about \$25,000, and there seems to be no doubt in the minds of the committee that this amount, or the greater part of it, can be raised by the close of the school year.

The Farm Department has a bulletin nearly prepared for publication, discussing the root growth of crops, a study of which was made last season. This bulletin will include twenty-four different cuts, showing the roots of nearly all common farm crops. These cuts are illustrations from the actual samples secured from the field. It is hoped that the State printing committee will see fit to permit the publication of this bulletin without delay, not only because the matter contained will be of interest to farmers, but it is proposed, if the bulletin can be published soon enough, to use some copies for distribution at the St. Louis Exposition, where an exhibit of these roots is being made. The exhibit has already attracted much attention, and a bulletin or pamphlet containing a description of the samples, etc., will be gladly accepted by those who take a special interest in this study. The suggestion has even been made to publish a few thousand extra copies as a special World's Fair edition, to be distributed in the manner mentioned above. It may not be necessary to give these publications away, but if they are neatly published they might be sold for a small amount as a souvenir. It is hardly necessary to add that this would be a nice little advertisement of the Experiment Station and its work.

PROGRAM FOR COMMENCEMENT WEEK, 1904.

FRIDAY, JUNE 10.—Society Commencement lecture to invited guests, College chapel, 8 P.M., Elias Day, characterist.

SUNDAY, JUNE 12.—Baccalaureate sermon, College chapel, 4 P.M., by Rev. Chas. A. Campbell, pastor Twenty-third Avenue Presbyterian church, Denver, Colo.

MONDAY, JUNE 13.—Recital by Music Department, in College chapel, 8 P.M.

TUESDAY, JUNE 14.—Examinations from 8:30 A.M. to 2:40 P.M. Class day exercises to invited guests, opera-house, 8 P.M.

WEDNESDAY, JUNE 15.—Examinations from 8:30 to 11:50 A.M. Business meeting of the Alumni Association, College chapel, 3 P.M. Alumni reunion, Women's Gymnasium, 8 P.M.

THURSDAY, JUNE 16.—Annual address, College chapel, 10 A.M., by Pres. W. O. Thompson, D. D., Ohio State University, Columbus. Presentation of diplomas. Cadet band concert on campus, 2 P.M. Military drill, 3 P.M. President's reception to invited guests, Hotel Gillett, 8 to 11 P.M.

ALUMNI AND FORMER STUDENTS.

Pauline Thompson, '03, visited the College last week. She was accompanied by her sister, who will enter College later.

Nellie S. Kedzie-Jones, '76, read a paper at the meeting of the General Federation of Women's Clubs, in St. Louis, May 21, on the "The School as an Ally of the Home."

W. O. Peterson, '97, of Argentine, Kan., is the author of a song entitled, "Then Be a Man; a Song Descriptive of Fine Manhood." He has asked the Students' Coöperative Bookstore to place it on sale. The retail price is twenty-five cents.

T. C. Davis, '91, of Benedict, Kan., visited the College last week in search of information concerning petroleum. He has some petroleum wells on his farm which he wishes to use to the best advantage. He is making no complaints of the way fortune is treating him.

H. A. Darnell, '92, will receive his INDUSTRIALIST hereafter at Lents, Ore., which is a suburb of Portland. He says that in the future he "will be connected with the noble art or science of agriculture." He and Maud Kennett-Darnell, '95, send best wishes to all friends.

H. B. Kempton, third-year in 1899, as field assistant in the Bureau of Forestry, is the author of bulletin No. 45 of that Bureau, on "The Planting of White Pine in New England." The bulletin is an interesting and valuable one, treating the subject from a practical and a commercial standpoint.

The *Nationalist* for May 25 contains a very interesting letter from H. N. Whitford, '90. He is now collecting in the Philippines, mostly fruits and flowers of trees, but takes in anything that comes along. Thus far he finds the climate delightful outside Manila, but looks for a change when the rainy season begins. He wishes the INDUSTRIALIST sent him, his postoffice address seeming to be Camp Worcester, Lamac, P. I.

F. E. Johnson, '99, A. T. Kinsley, '99, and Chas. Eastman, '02, who but recently graduated from the Kansas City Veterinary College, have all secured good positions. Doctors Johnson and Eastman are special agents for the Bureau of Animal Industry, at salaries of \$1200 per year, and are stationed at Chicago, Ill., and St. Joseph, Mo., respectively. Doctor Kinsley remains at the Veterinary College as an instructor, at an increased salary.

Mark Wheeler, '97, Captain Sixteenth Infantry, is visiting the home people, who now live here, and the College. Captain Wheeler's last visit was two years ago, since when he has been on duty in the Philippines again, as well as at several posts in this country. On his return from the Philippines he made a short stay in Japan and noticed with interest the preparations of that country for the conflict with Russia. He is now stationed at Fort Slocum,

which is located on David's Island, and is one of the defences of New York harbor. A detail to bring two car-loads of recruits out to Fort Riley is the occasion of his present trip. Army life seems to agree with the Captain, and he enjoys his work. He has the physical and mental characteristics necessary to an efficient officer, and if circumstances permit will doubtless rise high in the service.

Ed. H. Webster, '96, is the author of bulletin No. 58 of the Bureau of Animal Industry. This discusses the very important problem of the "Fat Testing of Cream by the Babcock Method." Since so much of the creamery business has come to consist in the handling of cream purchased of farmers who use hand separators, it has been found that the ordinary Babcock test, when applied to cream, gives results that are too high. The bulletin describes experiments that were for the most part made in the Chemical Department of the Experiment Station here, partly by Mr. Gray, of the Continental Creamery Company, and partly by Professor Webster in coöperation with Assistant Shaw. The results are important and conclusive, and the bulletin is one which should be in the hands of all who are interested in the purchase or sale of cream in which the price is based on the Babcock test.

ROBERT BURTICE MITCHELL.

The College community, and the town as well, was shocked by the news of the death of R. B. Mitchell, '99, first lieutenant United States Artillery Corps. As a student Mr. Mitchell was an enthusiastic member of the College battalion, and on the outbreak of the Spanish-American war he enlisted in the Twenty-second Kansas Volunteers. Mr. Mitchell was duty sergeant of his regiment, and it is said that much of the drilling of his company was intrusted to him. After the close of the war he returned to College and was made major and acting commandant of the College cadets until his graduation, June, 1899. After graduation he was elected assistant in veterinary science, with the expectation that he would also continue in charge of the Military Department. Before the opening of the school year he was appointed second lieutenant, Company E, Fortieth United States Volunteers. He left for the Philippines in October, 1899. Soon after his honorable discharge he was appointed second lieutenant in the United States Artillery Corps, and later was made first lieutenant.

Lieutenant Mitchell won his appointments and promotions by hard study and conscientious work. He was universally beloved by those who knew him, and his sudden death will bring sadness to many. The following is credited to the *Philadelphia Bulletin*:

"Clasping the hand of his fiancée, Miss Ellie Magee Raiguel, 603 North Seventeenth street, this city, Lieut. Robert Mitchell, of the United States Coast Artillery, died yesterday in the Government Hospital at Washington. Lieutenant Mitchell, who was stationed at Fort Monroe, went to Washington recently on special duty. On Saturday he had an interview with President Roose-

velt. The next day he decided to go to the Government Hospital and have an operation performed for hernia, which he had long intended doing. The operation was performed Monday, and later his condition became suddenly critical. At Lieutenant Mitchell's request a telegram was sent to his fiancée, and yesterday morning Miss Raiguel, accompanied by her brother, Dr. G. Earle Raiguel, took an early train to Washington. They arrived at the hospital a few minutes before the young soldier died. The engagement of Lieutenant Mitchell and Miss Raiguel was announced in *The Bulletin* of March 29."

The following has been received from the Washington alumni, a number of whom attended the funeral:

"Mitchell is gone; the sad news came with a shock to us who had seen him in perfect health only a few days before. He underwent an operation for a slight injury received on the football field, and no fears were entertained for his recovery until a week after the operation, when an internal hemorrhage caused him to sink rapidly. Before he went to the hospital he hunted up his old Manhattan friends, scattered as they are all over Washington and its suburbs, and the pleasant half hours we spent with him then and at his bedside in the hospital we little thought would be the last. Words are unnecessary to those who ever knew him, as a student, as a soldier, or as a man. The environment of the army life which ruins so many only served to round out his manhood and make it the more potent for good. To know him was to respect him; to be his friend was to love him. The K. S. A. C. alumni lose in him one of their truest and most loyal members."

The following general order explain itself:

FORT MONROE, VIRGINIA.

GENERAL ORDERS No. 40.

May 18, 1904.

"1. It is with deep regret that the commanding officer announces the death at 4:00 o'clock P. M. the 17th instant, at the United States Army General Hospital, Washington, D. C., of First Lieut. Robert B. Mitchell, Artillery Corps.

"Lieutenant Mitchell entered the army as a sergeant in Company "C," Twenty second Kansas Volunteers, on May 12, and was mustered out November 3, 1898. He was appointed second lieutenant of the Fortieth Infantry, United States Volunteers, August 17, 1899, and served in the Philippine islands with that regiment, until his honorable discharge on the 24th of June, 1901. He was commissioned a second lieutenant in the United States Artillery Corps, July 1, 1901, and promoted to first lieutenant July 31, 1903.

"By Lieutenant Mitchell's death the Artillery Corps loses a conscientious and efficient officer and his brother officers a faithful and well-beloved comrade.

"The usual badge of mourning will be worn by the officers of this command for thirty days.

"By order of Lieutenant-Colonel Potts:

CHARLES E. KILBOURNE, JR.,
First Lieutenant, Artillery Corps; Acting Adjutant."

Historical Society

VOL. 30

NO. 32

THE INDUSTRIALIST

ISSUED WEEKLY BY

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AGRICULTURAL COLLEGE

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Local Editor, - - PROF. J. D. WALTERS
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A SKETCH OF EARLY ENGLISH LITERATURE

THE early English literature had much force and energy of thought and expression, with much natural sweetness and pathos; but there is an absence of artistic form and literary skill; and no name is entitled to rank among intellects of the highest order, and no work of preëminent merit was produced before the fourteenth century, when Geoffrey Chaucer illuminated the literary horizon.

Among every people the earliest form of literature is the Ballad. The History and Poetry of a country are, in their infancy, identical. Oldest of all British literature are some scraps of Irish verse, ascribed to the fifth century. The Psalter of Coshel, a collection of metrical legends, is the oldest existing manuscript, but was not compiled until the ninth century.

The scanty remains of Scotch Gaelic are of much later date. The poems of Ossian, now supposed to be forgeries, were not published until 1662; and the ancient manuscript from which they were purported to be taken was never found. The poems of Taliesin and Merlin of the sixth century still remain, and in the early part of the sixth century there were a few Latin writers. Gildas is known by a "History of the Britons" and the Latin poems of St. Columbanus are spoken of by Moore as "Shining out in this twilight period of Latin literature with no ordinary distinction." Of the Latin prose writers the venerable Bede stands foremost.

Among the Anglo-Saxons the Minstrel was an important person. He related the deeds of heroes; and his memory was stored with the poetic legends of his country. When he became skillful enough to string events into verse, it went into the common stock of the craft, and so the Anglo-Saxon poetry is largely anonymous. The chief poems that have come down to us from this early period are the Romance of Beowulf and Caedmon's Paraphrase, to this latter poem, which is a series of religious poems, Milton's Paradise Lost bears a strong resemblance.

The greatest Anglo-Saxon prose writer was King Alfred, born 848. Two visits to Rome gave him a range of observation and thought which his quick and serious mind was ready to use to the advantage of his country. He gave an impetus to learning which Briton had never felt before. He invited learned men of France to preside over his schools and spent much of his own time in translating into Anglo-Saxon for the benefit of his people.

The famous Saxon Chronicle was the work of centuries. It was compiled to 891 by an archbishop of Canterbury, and then carried on by different monks in the monasteries—those conservators of learning during the darker ages. The latter days of Anglo-Saxon literature were feeble as compared to the vigor of its youth, but that any literature existed is a wonder, when such a cloud of darkness hung over all Europe.

With the invasion of the Normans in 1066 the old English literature lapsed into a comatose state, as it were; for the Saxons were slaves, and slaves never produce a literature. The Normans usurped all places of power, and Latin being the language of the Church, many works were written in that language in the centuries following the conquest. Then many poets of English birth took up the foreign strain and wrote in Norman French. Those romances relating to Prince Arthur are of special interest since Tennyson has embodied them in his well-known Idylls.

The literature of England during the Middle Ages was in the hands of the Monks and the Minstrels. The Monk sat in his cloister compiling dry but valuable works of history and theology, while the Minstrel roamed through the country singing ballads of love and war, always a welcome visitor, and dealing many a stinging rebuke to the follies of the Monks.

Of these early English writers Sir John Mandeville is the earliest, born about 1300 A. D. Wycliffe, the reformer, lived and labored about this date for the freedom of the Scriptures and against the corruptions of the Church. His great literary merit lies in his having given the first English version of the whole Bible.

The fourteenth century was a most important epoch in the intellectual history of all Europe. It was the transition period—the period of the revival of learning which appears to have owed its rise in most countries to translation. It was during this period that Geoffrey Chaucer (1328-1400) lived and worked. He is said by

some of the best critics to be the first English versifier who wrote poetically. Pathetic description is one of Chaucer's peculiar excellences, though a vein of humor is displayed in some of his works, especially in the *Canterbury Tales*. He possessed a genuine poetic sensibility, delicacy of feeling, and tenderness of expression not often found.

Prose literature advanced more in the fifteenth century than did Poetry. Sir Thomas More was a leading writer of this time. His intrepid courage and honesty of purpose have been the admiration of all succeeding years. No court favor or royal displeasure could turn him from the course his conscience dictated. His literary fame rests upon his "*Life and Reign of Edward V*" and the "*Utopia*." They are our earliest specimens of classical English prose. William Tyndale of this period is celebrated as translator of the New Testament. The old translation of Wycliffe had become unreadable to all but a learned few, in the changes which the language had undergone in a century. Late in this century was born Thomas Cranmer, who, aside from the eminent position he occupied in the political history of the time, was the compiler of "*The Book of Common Prayer*," used ever since in the State Church. During this century, also, Wm. Caxton introduced the art of printing, which soon revolutionized all literary work.

The sixteenth century was somewhat an improvement upon the previous; but no name of preëminent and lasting fame appears upon the annals of history, though it witnessed the first approximation to regular history in modern English. In the pages of Fabyan and Hall we find the first attempt at a systematic compilation of events. The greatest Scotch poet before Burns was Wm. Dunbar, a powerful and original genius who belongs in this century. Henry Howard, Earl of Surrey, was the first writer of English blank verse, and he gave English poetry a polish and refinement not found since Chaucer's time.

The Reformation in England influenced every phase of intellectual, as well as political life; and all the great reformers were writers of more or less literary worth. To Hugh Latimer, burned at the stake with Ridley in 1555, are attributed the glorious words, "We shall light such a candle this day, by God's grace, in England as, I trust, shall never be put out." His literary style was remarkable for its homeliness and wealth of droll anecdote. John Knox,

of Scotland, was also a writer. His chief work is "A History of the Scotch Reformation."

The Drama exists as an expression of a people's thought and manners; and in the early stage of the English drama we find the plays of a religious type, called "Miracle Plays," acted in the churches or monasteries, by the clergy, or under their direction. The only knowledge of the Bible the masses possessed during the Middle Ages was derived from these plays. Gradually these changed to the "Moralities," in which abstract qualities were personified, marking the advancement of the age. The introduction of human characters, instead of acting allegories, marks the rise of the true English drama. The first English Comedy was written in 1561, by Nicholas Udall; and the first tragedy in 1561, being the old story of Ferrex and Porrex dramatized by Sackville and Norton. But from these to the grand creations of Shakespeare was a sudden and enormous stride. This desire of humanity for amusement led to the greatest and highest acquisitions in all literature. Shakespeare's works stand pre-eminent; not alone in English literature but in every tongue and clime of the civilized world. Here at the pinnacle of literary production we may well pause, before reviewing the "Golden Age" of Elizabethan splendor.

INA E. HOLROYD.

HANDLING MILK FOR CHEDDAR CHEESE MAKING.

IN considering the art of cheese making it will be necessary to include not only the manufacture in the factory, but everything which has any influence on the results until the finished product is turned out of the curing room. The farmer, the surroundings, the cheese maker, the buildings, the conditions, etc., are all to be recognized.

In the first place, let us consider the manner of man we should have on the farm. That he should be intelligent, industrious, and honest, goes without saying; but he requires these qualities in a higher degree in the dairy business than in any other branch of agriculture, for the reason of the wide variation in the profits. One man will be making twenty to thirty per cent profit on his investment, while another is losing money and will be perfectly ignorant of the fact. This great difference is brought about by the amount of skill and care that enter into the work. Therefore, I would say that the two great requisites for the dairy farmer to

possess are the same as those required in any other business, namely, brains and application.

The day has gone by when farmers can afford to be ignorant. They must study, read, learn, and think; in fact, the ideal farmer must be a professional man and not a hewer of wood and drawer of water. He must be a chemist, a botanist, a bacteriologist, an entomologist, a veterinary surgeon, a mechanic, and a business man. All these and other studies are open to the farmer, and some knowledge of all is necessary to his welfare. In fact, no other profession offers such a wide field for the intellect, and yet we have farmers sons overcrowding the so called learned professions in the cities and towns.

Having procured a man with all the virtues he should possess, let us look for a moment at his farm (which is, of course, a dairy farm). A moist climate, good soil and plenty of pasture are necessary. We do not require a large farm, as a small one well looked after and cared for will be found more profitable than a large one which is neglected and has a big mortgage on it, as is often the case.

As for buildings, they should be sanitary, convenient, neat, trim, well built, and always kept in good repair. The dairy stables should be planned so that the stock may be attended to with the least possible amount of labor. They should be warm, roomy, and comfortable, five hundred to eight hundred cubic feet per cow. They should be well ventilated by removal of foul air and bringing in of fresh without creating a draught. Have plenty of light and face south if possible. Sunlight is cheap; it is nature's great disinfectant, and even diffused daylight has a beneficial effect. A plentiful supply of pure water is necessary, but it should be remembered that it is for drinking and washing purposes only, and that it makes poor cheese.

Next in order comes our stock. Keep any breed preferred, but keep good ones. It need not be imagined that because a cow has a long pedigree she must be a good one, and a breed should not be condemned because it contains some poor animals. As far as my experience goes, there is nothing in the dairy line so much misunderstood as the dairy cow. I have had dozens of men tell me that the Jersey cows give very little milk, but that the quality is good. This is not entirely true. Jerseys are noted for giving a large flow of rich milk, and if a Jersey does not do this,

something is wrong, probably the strain, and the sooner a change is made the better. I would advise all dairymen to learn the points of a good dairy cow, to study the principles of heredity, to buy and keep none but those known to be good, and in selecting a sire to look for something more than pedigree and points. Milk is your primary and final object, and the record of dam, grand dam and family in general should be ascertained.

A cow should receive the best of care and attention. A good cow will respond to kindness, liberal feeding and attention to her comfort and wants in general. I would advise feeding some substance, such as bran or meal, in addition to pasture at all times of the year, and also the growth of soiling crops for use when pasture becomes dry. Avoid feeding anything that is liable to taint the milk.

All this bears directly on the profits of the farmer, and through him indirectly on the manufacturers' profits, and on the quality of the cheese made.

We now come to an essential point in the production of the raw material, upon the quality of which will largely depend the quality of the cheese made. This point has been emphasized time and again with, I fear, small results. Nor do I see how we can expect any great reform until we find some way to bring home to the farmer the weight of his responsibility. The result of his neglect should be a corresponding depreciation in bank account.

Milk is a secretion of the mammals for the nourishment of the young. It has a specific gravity of 1.028 to 1.034. When first drawn from the cow it is both acid and alkaline in character, but the acid almost immediately gains ascendancy and continues up to a certain point, when the alkaline character, which has lain dormant, begins to overcome the acid, the latter having evidently worked itself out. Its composition is as follows:

	Per cent.
Water.....	87.5
Fat	3.6
Casein.....	2.5
Albumen.....	0.7
Sugar.....	5.0
Ash	0.7
	<hr/> 100.0

Water of milk is the same in chemical composition as ordinary water. Milk fat is in the form of little drops or globules, varying in size from $\frac{1}{1500}$ to $\frac{1}{25000}$ part of an inch in diameter, and are invis-

ible to the naked eye. These globules are held in suspension in the liquid, which form is called an emulsion. Casein and albumen are the nitrogenous or muscle forming part of the milk, and are partly in suspension and partly in solution. The milk sugar is in solution. It is capable of being converted directly into alcohol, and is easily changed into lactic acid by the action of at least ten different kinds of lactic acid bacteria. The effect of temperatures on the lactic acid germ is worthy of special note, as it is the means whereby we preserve the milk and which the cheese maker uses to develop the proper amount of acid at the different stages of manufacture. On this largely depends the character of the cheese made. The lactic acid germ does not develop below 15 degrees Fahrenheit, and increases fast from 59 to 107 degrees, then diminishes and ceases at 113 to 114 degrees F. It will be seen by this that a temperature below 59 degrees F. is suitable for holding milk which is to be kept for some time. Ash or mineral matter is mostly in solution, and consists of that portion of the milk which cannot be burned.

Milk in the udder is practically sterile, or free from germs, but the moment it is drawn off it becomes contaminated with bacteria and other taints. The former come from different sources; the teat acts as an incubator. From the time of one milking to the next, large numbers of bacteria develop in the milk left in the duct; particles of filth and manure adhere to the udder when the cow is in a reclining position, or when wading through swamps muddy streams, etc. These filth particles adhere to the lower end of the teat, and from there find their way into the duct, where the conditions for development are very favorable. So it is that the first few streams of fore milk are seeded with bacteria in great numbers. The hairy coat of the cow is more or less covered with dry excrement, mud, filth from the stables, from the barn yard and muddy fields. A whisk of the tail or stamp of the foot, in fact, any motion of the animal or milker, serves to dislodge them and they fall into the milk pail. Dirty or dusty garments of the milker also contribute to the general supply. Particles of dust floating in the air have germs attached to them, and these fall into the milk. This occurs frequently in a barn where dry and dusty fodder and bedding is used. Perhaps the most common source of all is the use of unclean dairy utensils.

How then, one may ask, are we going to keep our milk free

from germs? We cannot. Nor is it necessary, as many of them are useful and we are obliged to enlist them in our service in the manufacture of both cheese and butter. What we can do, however, is to reduce the number to such an extent that they will give little or no trouble, and the cheese maker will have a chance to develop those kinds he requires and crowd out the undesirable forms.

Bacteriologists tell us to throw the first few streams of fore milk, and to moisten the sides and udder with a damp cloth, but a good many practical men take exception to this, because throwing the milk on the stable floor creates a nuisance. It might also be mentioned that the majority of the germs found in the fore milk belong to the lactic acid group, and as a certain number of these are required, we may safely let them go into the milk pail. As for the damp cloth, a cow should first be kept clean, after which if a soft dry cloth is used on the udder it will be found sufficient.

All vessels brought into contact with milk, such as cans, pails, strainers, etc., are a prolific source of germ life, and the most thorough scalding will not serve to sterilize them, although it will greatly reduce the greater number of germs in them. Wash with cold or warm water first, to cleanse them from particles of milk, then scald or steam thoroughly. Taking the by-products back to the farm in the same set of cans used for the milk is to be condemned, owing to the rich germ life found in these products and the filthy condition of the whey tanks throughout the country.

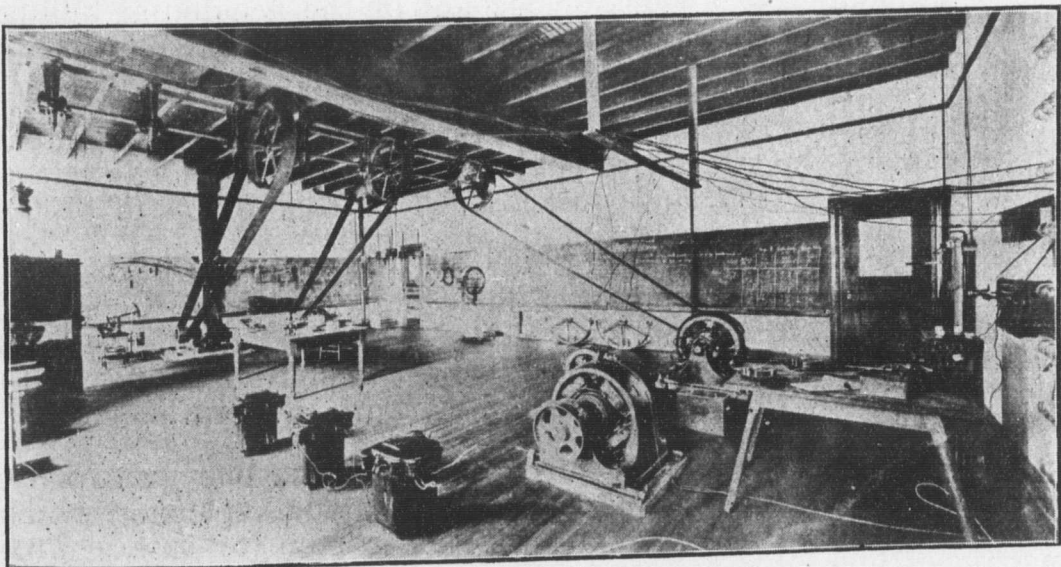
Do not buy cheap or poorly soldered tinware, as the milk gets into the cracks and crevices and is difficult to remove. It will be found a good plan to take all utensils to the tinsmith and have soldered the ears of the pails, all the joints, and any place where milk or dirt can lodge. Remove milk from the barn immediately after milking and strain in a pure atmosphere. Aerate milk immediately after milking, and cool only to the temperature of the atmosphere. An ordinary tin dipper will do for the purpose, but there are many excellent aerators on the market, which save labor, and where they are in use the work is not likely to be neglected.

Having produced a first-class article on the farm, it is ready to hand over to the maker, and we now make the acquaintance of our friend, the driver, who forms the connecting link between the farm and the factory. This gentleman seems to be pretty much the

same all the world over, and never improves very much. Perhaps about all we can tell him to do is to keep clean, and as different people have different standards of cleanliness he takes his own and is satisfied. His wagon should be supplied with springs, should be kept painted and washed, his horses should be clean, and above all he himself should be clean. G. A. MENZIES.

The general program pamphlet of the Colorado Chautauqua, at Boulder, speaks of one of our senior girls in the Domestic Science course in the following handsome manner: "Miss Wayland, who last season managed the cooking so admirably, is now promoted to the directorship of this important school. Her sunny nature and clear head, backed by her wide experience and responsibilities, insure the chautauqua a successful and popular administration. She will have immediate charge of the cooking classes, and will give several lectures on public and private sanitation."

The Union Pacific has made arrangements whereby students going home at the end of the term may buy their tickets several days before starting. If for any reason the ticket so purchased is not used the company will refund the money. Another convenience arranged for College people is a trunk identification check which will save considerable confusion and annoyance, and will be explained later. The checks are being prepared in the Printing Department.



Electrical Laboratory.

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LOCAL NOTES.

Doctor Mayo went to Hoxie and Grainfield on Friday to see some sick cattle.

Miss Ella Weeks, of the Department of Industrial Art, visited the State University last Monday.

Doctor Mayo was called to Hoisington, Wednesday, and Waterville, Friday, on State veterinary work.

Nellie Rickman, of the domestic science course, took first prize for "angel food" in the W. C. T. U. baking contest.

The graduating class this year will probably number a full one hundred—the largest class in the history of the College.

The Rock Island will place on sale, on June 6, 13, 20, and 27, round-trip tickets to St. Louis for \$8, return limit six days.

Professor Erf writes from St. Louis, where he is doing expert work in the dairy division of the Louisiana Purchase Exposition, that he will be with us during Commencement week.

From present indications there will be about a car load of College people start to the World's Fair on Monday, June 20, over the Union Pacific. A special rate of \$8 for the round trip has been secured.

Apprentice Ed. Young, of the Heat and Power Department, was called home last Monday on account of the accidental killing of his father, who fell out of a wagon, at Paola, Kan. We do not know the particulars of the accident.

Manhattan is growing in numbers and grace. In the annual adjustment of the salaries of postmasters, Manhattan was raised from \$2300 to \$2400, and Junction City from \$2200 to \$2300. Marysville was decreased from \$1800 to \$1700.

W. W. Truxel, of Hoisington, said recently to Doctor Mayo that he had employed Agricultural College students in the harvest field for the past four years and that he was highly satisfied with their work—said they were splendid workers and gentlemen.

The Farm Department has purchased, from the Avery company, a new thrashing outfit. The Aultman & Taylor separator which has been used for the last three years is now for sale. This machine is in good repair and will be a bargain to some farmer who wishes to purchase an outfit simply to do his own work.

President and Mrs. Nichols entertained the seniors in the Domestic Science Hall Friday evening. Social guessing contests were provided. The punch bowl was presided over by the Misses Hofer and refreshments served by some of the junior girls.

Hurrah! The soliciting committees of the Y. M. C. A. report much enthusiasm and corresponding progress with regard to the subscriptions for the association building. It looks as if the \$25,000 required would be subscribed before the close of the College year.

The Department of Physical Training has lately added to its equipment a horizontal bar, a balance swing, a jumping stand, a wand rack, a medicine ball and an additional spring board. All the calisthenics classes will be open to visitors during the last week of the term.

The College battalion and the College band took a prominent part in the parade and exercises on Memorial Day, May 30. The cadets fired a salute over the graves of the departed heroes and the band furnished the music for the procession and the program in the opera-house.

The seniors have received advanced plates of their class-book. The volume will contain photo-engravings of all the class members of 1904, the Faculty, including the members of the board of instruction who retired during the past two or three years, and a large number of views from the campus and the society rooms.

The improvements which are being made on the College farm, in the way of new fences and roads, are attracting favorable attention from the neighboring farmers. Every one wants to build a woven-wire fence with red posts. Several inquiries have been received in regard to cost, etc., of such fencing. The fence which was used is largely the spring-steel, woven-wire fence, manufactured by Kitselman Bros., Muncie, Ind. Some of the Elwood fence has also been put up. This fencing is manufactured by the American Steel and Wire Co., Chicago, Ill. The iron gates were purchased from the International Fence Co., Columbus, Ohio.

In the *Breeder's Gazette* for May 18 is a handsomely illustrated article on "A County Agricultural School," written by Mr. K. C. Davis, its principal. Mr. Davis is a graduate of the Kansas State Agricultural College in the class of 1901, and was a classmate of F. A. Waugh, professor of horticulture in Massachusetts State University; F. C. Burtis, professor of agriculture of the Oklahoma Agricultural College; H. W. Avery, the big Percheron horse-breeder at Wakefield, Kan.; Phil S. Creager, telegraph editor of the *Kansas City Daily Journal*; Clay Coburn and his two sisters, children of Hon. F. D. Coburn; and the Rev. C. A. Campbell, of Denver, to whom is accorded the honor of delivering the baccalaureate sermon of his alma mater in the next Commencement exercises.—*Kansas Farmer*.

On Friday afternoon of last week the members of the Agricultural Association, with their special friends from the Domestic Science Department, had a spring outing and picnic on the hill range about three miles west of the College. All report a good old time, plenty of fun and lots to eat.

*"Ach, wenn sie ewig grüne bliebe,
Die schöne Zeit der jungen Liebe."*

The Farm Department is making extensive variety trials of grains, corns, and other farm crops. Twenty-five varieties of winter wheat and rye and twelve varieties of winter oats and barley were planted last fall. The wheat and rye stood the winter and are in good condition at this writing. Most of the oats and barley, macaroni wheat and emmer were winter killed. There has been sown of spring grains, eight varieties of spring wheat, twenty-two varieties of oats, twelve varieties of barley, two varieties of emmer, thirty varieties of flax, and several varieties of field peas and vetches. Over eighty varieties of corn have been planted, and it is proposed to plant a number of varieties of cane, Kafir corn, soybeans and cow-peas. The results of the variety trials last season, of the above crops, are published in bulletin No. 123, just being issued.

The Farm Department is not only repeating a large part of the experiments which were carried on last season, but new branches of work are being taken up. One of the interesting new lines of work is the experiments with flax. The flax crop is not yet grown extensively in Kansas, and little is known in regard to the adaptation of varieties, time of seeding, best method of cultivation, etc. Some thirty different varieties of flax are being grown on the Station farm this season. The seed of twenty-four of these varieties came directly from Russia through the United States Department of Agriculture. Experiments are also being carried on in thickness of seeding and time of seeding. A plot of flax has been sown every ten days since March 28. Considerable demand has been made on the Farm Department for information regarding the growing of this crop, and these experiments may help to answer the questions received.

The Kansas State Agricultural College will be well represented in the different buildings of the World's Fair at St. Louis. Prof. A. B. Brown has sent a large frame four by six feet, with artistically arranged illustrations from Brown's Prismatic Charts of Music and Elocution. These charts are placed in the educational building. A novel exhibit is the automatic picture machine, which shows one hundred ninety pictures, including views of the College buildings, campus, farm animals, interior views, groups and photographs of all the Faculty and assistants, the churches of the city, and a view of the Union Pacific depot. The contrivance is an invention of President Nichols and Professor McCormick. It is run by an electric motor and its mechanism is enclosed in a glass cabinet about two feet wide and six feet high. The pictures are arranged on a rotating cylinder which exposes four

views at a time, taking about ten minutes to show the entire number. The Farm Department has sent some root samples, showing some interesting root growths. The roots of the drouth-resisting crops, such as alfalfa with roots eight feet long, and the native buffalo and blue-stem grasses with roots four feet long. They will be shown in the original shape as when growing. The Mechanical Department has arranged a fine collection of tools. The Horticultural Department has sent some post timbers, which include the hedge orange, red cedar, mulberry, and some other specimens of post timbers. They will also send exhibits of fresh fruits in their seasons. The Chemical Department has prepared some samples of Kansas sorghum sugar and syrup. The Entomological Department has arranged a fine display of wood-boring insects and some interesting studies of the ant. Samples of various kinds of cookery, including fruits, cake, cookies, etc., have been prepared by the Domestic Science Department. Besides the big four-thousand-pound steer, the Animal Husbandry Department is fattening some Hereford steers, which are showing up in fine shape.

ALUMNI AND FORMER STUDENTS.

Robert J. Brock, '91, has resigned his position as Regent of the College on account of private business.

Chas. A. Campbell, '91, of the Twenty-third Avenue Presbyterian Church, Denver, Colo., will deliver the baccalaureate sermon this year.

John Scott, senior in 1903, assistant in agriculture in the New Mexico Agricultural College, returned this week to spend the Commencement season.

Friends of Major Albert Todd ['72] will be interested to learn that he has been transferred from Presidio, Cal., to Washington, D. C., where he is assistant adjutant general.—*Nationalist*.

Hannah Wetzig, third-year in 1895, has been nominated for superintendent of public instruction for Riley county by the republican party. J. C. Christensen, '94, C. M. Breese, '87, and E. J. Davies, second-year in 1884, were renominated for the offices of treasurer, clerk, and probate judge, respectively. A knowledge of the offices held by graduates and former students throughout the State would be interesting.

Prof. J. B. S. Norton, '96, state pathologist for Maryland and professor of botany in the Maryland Agricultural College, visited us for the first time in three years. He spent but a few days in town, and was accompanied by Mrs. Norton (Gertrude Havens, '96) and their infant daughter. Mrs. Norton will spend the summer with her parents near Dwight, Kan. Her health has not been good and it is hoped that Kansas breezes will prove beneficial. Professor Norton's duties keep him very busy so that he could remain but a few days in the State.

The *Springfield Republican* for May 22 contains a trenchant article by F. A. Waugh, '91, on the financial error in cutting young forest growth for cordwood when much more could be realized by allowing time for maturation into more valuable forms of timber. Operations now in progress on the Holyoke, Mass., range furnished the text.

Mary C. Bower, '83, was married May 27, at 10:00 o'clock A.M., to Mr. Isaac L. Ady, of Romulus, Okla., by Rev. O. B. Thurston. The ceremony took place at the home of the bride's parents in the presence of a few relatives, after which a luncheon was served. Mr. and Mrs. Ady left the same day for their home near Romulus, Mr. Ady being a prosperous farmer. They have the best wishes of their friends for their future.

A LETTER TO THE ALUMNI.

DEAR FRIENDS:—There should be a large number of the members of the Alumni Association in attendance this Commencement. Wednesday, June 15, is Alumni Day, and every member who attends Commencement exercises should plan to arrive before the business meeting, which will be held in the College chapel at 3 P. M. The committee in charge of the work of ascertaining the wishes of the alumni in regard to the erection of a memorial is preparing a report setting forth the preferences of the members. It is earnestly desired that there be a large attendance at this meeting in order that whatever is done may be done by as large a part of those interested as possible.

It has been suggested that some plans be formulated whereby the attendance at the triennial banquet in 1905 may be more largely attended, especially by the older members, than has any previous reunion.

The success of last year's informal reunion was gratifying to all in attendance; the greater opportunities for meeting old friends and making new ones afforded by the informal evening in the Women's Gymnasium made the occasion a most pleasant one. The executive committee has planned for the reunion this year some features which it is believed will make it easier for old friends to find each other and give all a better chance to extend their acquaintance with members of classes other than their own.

The debt of the alumnus to his Alma Mater is one not always appreciated and never fully paid. The evidence of the appreciation by others of the fitness of the alumni to share in the councils of the College, shown by the appointment of members of the Association upon the Board of Regents, is a matter of pride to every graduate.

Such a rare combination of duty, privilege and pleasure as is afforded by a visit to the College during Commencement week should not be lightly passed. It is earnestly hoped that the coming Commencement will be more largely attended by alumni than any previous one in the history of the College.

Fraternally,

ALBERT DICKENS,

Pres. Alumni Association.

VOL. 30

NO. 33

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

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Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

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THE INDUSTRIALIST.

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MANHATTAN, KAN., JUNE 11, 1904.

No. 33

THE KANSAS STATE AGRICULTURAL COLLEGE IN 1903-'04.

A RETROSPECT.

THE approaching commencement of 1904 will close a year of external and internal growth not surpassed by that of any of the forty-one years that have passed since the organization of the Kansas State Agricultural College. There has been an increase in students, an increase of members of the board of instruction, and a considerable increase in apparatus and means of illustration. Two new buildings of a substantial character were added to the "city on the hill," the water-works have been contracted for and commenced, and a number of sheds, a silo, and many other smaller buildings were erected. The Experiment Station has added new fields to its complex, the branch station at Fort Hays has been developed, the courses of study have been revised, another term has been added to the work of the preparatory course, and many details have been looked after and settled that had been on the program for many years. In short, there has been growth—substantial and commendable growth—all along the line.

The year now drawing to a close was a year of peace and good order for the College. The Board, the Faculty and the students worked harmoniously as they never worked before. There were no cases of serious disorder among the students, no class fights, no suspensions for boisterous conduct, no instances of severe discipline, no scandals of any kind. The writer of these lines has been a member of the Faculty since December, '76, and he can say without hesitation that the year drawing to a close has been the most harmonious of the twenty-eight. In the early years of the College the students were governed by printed rules and a code of penalties; the Agricultural College to-day has no other rule for conduct than the simple sentence: Behave at all times and in all places like a true gentleman or lady and attend to business. We venture to say that there is not in existence another educational institution of the size of the Kansas State Agricultural Col-

lege which, during the past school year, has been so free of disciplinary cases and so full of good cheer and hearty coöperation among the whole large "college family."

THE ATTENDANCE.

The following figures, culled from the forthcoming catalogue, will give the patrons of the College an idea of the magnitude of the educational work carried on at this, the most characteristic institution of the State.

SUMMARY FOR 1903-'04

CLASSES.	Men.	Women.	Total.
Graduate			
Senior	10	10	20
Junior	75	39	114
Sophomore	110	51	161
Freshman	148	58	206
Preparatory	259	144	403
Special	237	106	443
Dairy	19	14	33
Farmers' Short Course	16		16
Domestic Science Short Course	122		122
Apprentices		51	51
	71	1	72
Total	1067	474	1641
Counted twice	28	8	36
Net total	1139	466	1605

Of these 1605 students, 1579 are from Kansas and 26 from other states. Compared with the attendance of other years, the following interesting data may be given: In 1878-'79 the total attendance was 207; five years later, *i. e.*, in 1883-'84, it was 395, a growth of 188 students; in 1888-'89 it was 445, a growth in five years of 50 students; in 1893-'94 it was 555, a growth of 110 students; in 1898-'99 it was 870, a growth in five years of 315 students; during the past five years the increase has been 735, *i. e.*, the increase has been greater by 180 than the whole attendance of ten years ago, or almost as great as the whole growth of the first 37 years.

The number of senior class students last year was 86, of whom 54 received their certificates of graduation. In 1890 it was 28, of whom 28 graduated. In 1880 it was 11, of whom 7 were given their final papers. This year the senior class numbers 114, of whom probably an even 100 will pass the final examinations.

Numbers do not always express the amount of real growth of an institution, but they help to form comparisons, and the College can certainly point with pride to these statistics.

There has been growth and development in the work done in the class rooms, shops, and laboratories. The standard of

admission to the first-year classes was raised five times since 1879. It was raised again this spring for students entering next fall. The College now demands a full year of preparatory or ninth-grade work for entering the regular four-year courses, and the mature age of at least 18 years for entering any of the short courses. Other regulations concerning the courses of study for next year have been adopted that will strengthen the work in some lines. For a synopsis of these we refer to the forthcoming annual catalogue.

INTERESTING FIGURES FOR LEGISLATORS AND TAXPAYERS.

The following table, compiled by President Nichols and taken from the United States government reports, will show our patrons the position which the Kansas State Agricultural College occupies with regard to the economical aspect of its work:

COLLEGES.	Average of six years, 1896-1902.				1902.	
	Enrolment.	Faculty.	Income.	Annual cost per student.	Volumes in Library.	Property.
Kansas.....	1025	50	\$109,695	\$107	26,025	\$1,083,047
Iowa.....	950	63	141,375	149	18,500	1,496,923
Indiana.....	891	67	148,647	166	14,411	1,096,000
Michigan.....	557	46	156,402	281	23,076	1,814,910
South Dakota....	448	24	63,403	142	17,626	1,029,500
North Dakota....	378	25	61,545	163	9,100	1,444,225
Colorado.....	370	28	73,697	199	23,900	533,119

It will be seen that this College occupies first place with regard to enrolment, first place with regard to the size of its library, and third place with regard to size of Faculty, but that the annual cost per student is less—in fact way below that of every other institution. The item of cost is one that the taxpayers are investigating at all times with a good deal of interest. Let them remember, then, that the annual cost to the State per student is not only less at this College than at any of these six representative sister institutions, but about one-fourth less than at Iowa, about one-half of that of Colorado, and less than two-fifths of that of Michigan. With regard to the total income, this College stands fourth, with regard to property fifth, and with regard to enrolment first.

THE NEW AUDITORIUM.

The last legislature, after convincing itself of the overcrowded condition of the old chapel and the adjoining halls and corridors, appropriated \$40,000 for a new assembly hall, and the Board of

Regents immediately took steps to erect a separate building for this purpose. The drawings and specifications for this structure were furnished by architects Holland & Squires, of Topeka, and the erection and completion of the building was contracted to Henry Bennett, the well-known builder of Topeka, Kan.

This building, the "Auditorium," as it will be called, is nearly ready for the plastering, and will be completed, heated and furnished by the beginning of the next fall term. It will seat between twenty-five hundred and three thousand persons and contain all the modern conveniences found in public halls and theaters. Nine large doors, all of them opening outward, will facilitate a very rapid evacuation of the seats and the rostrum. The building is well lighted, properly ventilated, and will be heated by steam from the central plant at the shops. The exterior is not pretentious, but betrays by its many windows and doors and its modest forms that interior convenience has been the main consideration. It is built of the beautiful white Manhattan limestone, which has given the older College buildings their substantial and dignified character.

THE NEW DAIRY HALL.

Another building, the new Dairy Hall, provided for by the last legislature, is entirely completed and waits for the Department of Dairy and Animal Husbandry to occupy it. This building has cost \$15,000. It was built by contractor John Winter, of Manhattan, and planned and specified by Prof. J. D. Walters, of this College, and it may be added that the professor has also superintended its erection and that of the Auditorium. Like the other buildings "on the hill," it is built of Manhattan limestone (quarried on the College farm), and though it is but one story and a half high it presents with its four stone gables, its tall chimneys and ventilators, and its neat tin shingle roof a substantial and pleasing exterior. The interior is cut up into an office, a large class room, a 40x40 foot creamery room, a large cheese room, a 30x50 foot laboratory, and several smaller apartments. It will be heated from the central plant, a connecting tunnel arched with brick having already been completed.

OTHER IMPROVEMENTS.

Of other improvements made during the past year may be mentioned a new one-hundred-ton silo, several hundred rods of

new woven-wire fence, with painted white cedar posts, three new piggeries, several corrals and pens, the rebuilding of the south basement of the old barn into a repository for agricultural machinery, the rebuilding of a part of the basement of the library building into a society room for the Franklins, the plastering and flooring of the attic of Agricultural Hall and its conversion into a mouse-proof seed room, the building and arching with brick of several hundred feet of heating tunnels, the rebuilding of the two front porches of Anderson Hall, etc., etc. The Board of Regents has also had drawings and specifications made for the new College water-works and has contracted the job to Mr. George Hopper, of Arkansas City, Kan., who will undoubtedly have the plant in working order by next September. This long-needed improvement, costing \$10,000, will make the College independent of the city water-works, furnish the needed water pressure in case of fire, and save a good part of the \$1500 which the institution has paid annually for its water-supply.

THE EXPERIMENT STATION.

The Experiment Station work has proceeded satisfactorily the past year. On the farm the testing of large numbers of varieties of agricultural plants has been conducted. The season's work has been reported in bulletin No. 123, comprising 58 pages of text and 10 plates. Two hundred forty acres were used, divided into 360 plats ranging from one-tenth of an acre to five acres in area. With the exception of the excessively wet weather in May, the season was very favorable. Among the crops grown, corn, wheat, barley, oats, emmer, flax, millet, sorghums, broom-corn, soybeans and cow-peas may be mentioned. Special tests of farm crops, late pasture crops and silage crops were made. Experiments in baling alfalfa in various stages of curing showed that it is not safe to bale it until well cured. Two series of rotation experiments were begun, also seed selection with a view to improvement of the various farm crops.

A number of experiments in feeding have been completed, including a test of different breeds and cross breeds of swine from birth to maturity, the experiment beginning in July and ending in February. The various silage crops were used experimentally in feeding, the mixture of cow-peas and corn silage proving especially satisfactory. A corn silage and alfalfa ration for dairy cows

was compared with one consisting of these and grain. In steer feeding alfalfa was compared with alfalfa accompanied by a variety of other much less nitrogenous roughages; the grain ration of corn-and-cob-meal, and toward the end of the experiment cottonseed and corn-meal, being the same in the two lots. Six lots of pigs were fed rations including cottonseed-meal. Starting with a small amount, it was finally made as much as twenty per cent or more of the ration without any fatal results. The pigs all thrived upon it. These lots included sows with suckling pigs. Experiments are in progress with fall pigs to test sorghum, Kafir-corn and corn, each fed with soy-beans. One lot is being fed corn alone.

In the Dairy Department experiments in pasteurization have been made, with others.

The horticultural work was impaired by the flood which nearly destroyed the leased orchard on the Spohr farm, where cultivation, summer pruning and cover-crop experiments were in progress. The unprecedented hail-storm and the late freeze in the spring practically ruined the fruit crop. In the vegetable garden some interesting results were obtained with tomatoes, celery, salad plants, etc. The prospects this spring are the best in the history of the department.

The Botanical Department has continued work in testing cereals on the small scale, among them a large number imported from Germany. Hybridization with a view to improving varieties has been conducted. An interesting cross between wheat and rye has been obtained.

The Chemical Department and the Veterinary Department have coöperated in the investigation of dips for cattle. Much work has been done upon the lime-sulphur dip, and some upon others. The fertilizer law passed by the last legislature is being enforced this year and the analyses connected therewith are being made by the Chemical Department for Secretary Coburn of the State Board of Agriculture.

At the Fort Hays Branch Station the season was very favorable and a magnificent crop of wheat was harvested, including tests on a small scale of a large number of varieties. Part of this has been in coöperation with the United States Department of Agriculture. Coöperative experiments with the Department have also been continued at Halstead, the fall seeding being made, however, at

the new location near McPherson. Some four thousand separate plantings were made there.

The preceding statement is by no means a complete one of the work of the Experiment Station, and some important investigations may have been overlooked.

Only four bulletins have been printed during the year, the smallest number since 1894. The bulletins are large ones, however, aggregating 249 pages, so that the total amount is about the same as in recent years. Completed bulletins are on hand amounting to at least as much more.

POINTS ON BUTTER MAKING.

BUTTER, like other dairy products, varies considerably in its composition or make-up; it consists chiefly of fat, which may vary from eighty to ninety per cent and averages about eighty-four per cent. The water may vary from eight to twenty per cent, and it is possible to make good butter that will contain from fourteen to sixteen per cent water. If it contains over sixteen per cent water it is deemed adulterated in United States markets. Butter made from pasteurized cream tends to be somewhat drier in appearance than butter made from unpasteurized cream.

In a whole-milk creamery the principal conditions affecting the per cent overrun are: fat lost in skim milk, per cent fat in cream, acidity before churning, temperature churned, temperature of wash water, and the fat lost in buttermilk. Cream should always be churned cold enough so as to get an exhaustive churning. If hand separator cream is received, the butter maker should be careful as to the amount of rinse water added, as it has a tendency to injure both quality and quantity.

Good butter should be mild, sweet, clean, and pleasant in flavor. It is impossible to describe this delicate aroma which forms nearly one-half the value of butter; lack of flavor, bitter, greasy, lardy, fishy, woody, cheesy, dirty, buttermilky, cowy, musty, and cooked flavors, are common defects. The grain and texture should be waxy, firm yet pliable, should break like a piece of cast-iron, and not be greasy or salvy in appearance. The color should be uniform, clear and bright, ranging from white to a yellow shade. There should be no mottles, waves, streaks or specks in the butter. The salt must be dissolved and the quantity used should suit the taste of the consumer. Some markets,

like Boston, require much salt in butter, while some buyers in the New York market require scarcely any. The butter maker must cater to the markets with regard to the amount of salt to use, as he does with regard to color. For instance, it is perfectly possible under certain conditions to get a higher percentage of salt in butter by salting at the rate of one ounce per pound than is possible under certain conditions by salting at the rate of one and a half ounces. This means that under certain conditions of salting more salt is lost than under others. When the butter is salted before the wash water has had time to drain away, any extra amount of water remaining will wash out an extra amount of salt. It is good practice, however, to use a little extra salt and drain less before adding it, as the salt will dissolve better under these conditions.

Small butter granules require more salt than large ones. The reason for this may be stated as follows: The surface of every butter granule is covered with a thin film of water, and since the total surface of a pound of small granules is greater than that of a pound of larger ones, the amount of water retained on them is greater. Small granules have therefore the same effect as insufficient drainage, viz., washing out more salt. The shape of the granules causes more water to be retained, hence we get a larger overrun from thick cream, as the granules are more ragged in shape.

Salt adds flavor to butter and materially increases its keeping quality; very high salting, however, has a tendency to detract from the delicate aroma of butter, while at the same time it tends to cover up slight defects in the flavor. As a rule, a butter maker will find it to his advantage to be able to salt his butter rather high. Salt very readily absorbs odors and must therefore be kept in clean, dry places where the air is pure. Too frequently it is stored in musty, damp store-rooms, where it will not only lump, but become impregnated with bad odors which will impair the quality of the butter. Coarse or over-churned butter needs a great deal of working because of the greater difficulty of distributing the salt. A salt that does not readily dissolve requires excessive working and is therefore productive of over-worked butter.

The causes of trouble in churning may be enumerated as follows: Thin cream, low temperature, sweet cream, high viscosity of cream, advanced period of lactation, and abnormally rich cream.

This is the age for pasteurizing, and I believe every butter maker should make it a special study. We have been conducting experiments at our school with sour cream and have decided that it is better to do the experimenting before the acid develops. The class work came in the forenoon, leaving every afternoon and all day Monday for laboratory work, consequently the Saturday cream was held over until Monday.

It is supposed by some that pasteurization decreases the butter yield on account of causing a greater loss in the buttermilk. Our experiments did not show any particular difference between the loss in the buttermilk from pasteurized and raw cream. The buttermilk from pasteurized cream tested as low as six hundredths and as high as twenty-five hundredths of one per cent, depending upon the temperature at which it was churned. It is also claimed that butter made from pasteurized cream has a defective body. Butter made from pasteurized cream has just as good a body as that made from raw cream, providing it is handled right. Pasteurized cream must be cooled to a lower temperature than raw cream and held somewhat longer at a low temperature before churning.

Our first experiment was to pasteurize the cream in the afternoon, cool down to fifty-eight degrees, add the culture, let stand over night, cool down to fifty-three degrees, and churn in the afternoon. This first method gave very poor results, as the butter took on a decidedly old flavor.

Our second experiment was to pasteurize the cream in the morning, cool to sixty degrees, add culture and cool to churning temperature, fifty-one degrees, and churn in the afternoon, leaving about five hours between pasteurizing and churning. This latter method has given very good satisfaction, as the butter fat has a much shorter time to lie in the old milk serum. At present we are churning at forty-eight degrees.

Cream was treated as mentioned in the second experiment and was sent to the national contest at Chicago and was pronounced perfect in every thing except flavor. The cream from which the contest butter was made was one week old and had five-tenths of one per cent of acidity before pasteurizing, and the per cent overrun was twenty-four and four-tenths.

Let us combine our knowledge of pasteurization, starters and scientific cream ripening, never losing sight of the fact that it

takes good milk and cream to make good butter, and let us make our business more of a science in the coming years than ever before.

G. A. MENZIES.

SUBSOILING.

IN 1893-'97 this Station made quite extensive experiments in subsoiling land both for wheat and corn. In summing up the results of these trials in bulletin No. 71 of this Station, Prof. C. C. Georgeson makes this statement: "Our experiments with subsoiling, both for wheat and corn, indicate that there is a positive loss, not only of labor but of yields, by subsoiling here on the College farm." In bulletin No. 64 Professor Georgeson explained the unfavorable results received from subsoiling by the fact that the subsoil on the College farm is rather a porous clay loam, without hard-pan, and subsoiling such land for wheat or corn is not necessary or even desirable.

At the North Dakota Experiment Station, subsoiling the land for wheat gave slightly increased yields, but the increased cost of the extra work in each case was greater than the increased value of the crop. The effect of subsoiling, where the soil is loosened several inches below the bottom of the ordinary furrow, is to make a better water reservoir, *i. e.*, it opens up the soil so that more water can be absorbed if the rains come; but the soil being loosened gives it less capillary power to lift water from below, and in a dry season subsoiling may prove detrimental by causing the soil to dry out near the surface. For potatoes and root crops, subsoiling has given good results, but for wheat and corn such treatment does not seem to be necessary or profitable in the average soil.

In gumbo soils or in land which has a hard-pan character near the surface, subsoiling may prove beneficial, and may even be necessary in order to produce paying crops. The best time to subsoil is in the fall, in preparing for planting a spring crop. During the winter the soil will settle and firm up and absorb water, giving a more favorable seed-bed for spring seeding than could be prepared by spring plowing and subsoiling. Care must be taken not to subsoil when the ground is too wet. For this reason fall subsoiling is usually preferable to spring subsoiling.

A practice (also called subsoiling) of plowing a little deeper every three or four years and bringing up an inch or so of new soil to the surface is, in my opinion, preferable to subsoiling. By this

method the capacity of the soil to absorb rain-water is increased, the hard condition of the subsoil made by the tramping of the horses is broken up, new soil is brought to the surface where it can be acted upon by the weather and the soil bacteria, and the depth of the fertile soil is increased. Such plowing should usually be done in the fall, preceding corn or some other cultivated crop.

Part of the above has been quoted from an article on soil cultivation, by the writer, published in the report of the Kansas State Board of Agriculture for the quarter ending March, 1903. I may add that I favor the use of the subsoiler attachment, provided on some plows, especially disk plows, by which an inch or two of soil may be loosened at the bottom of the furrow, thus breaking up the hard, smooth surface left by the bottom of the plow and allowing a better union between the furrow slice and the subsoil, promoting the reestablishment of the capillarity by which the water may be drawn more readily from the subsoil up into the surface soil, where it is needed by the germinating seeds and young, tender plants.

A. M. TENEYCK.

The Teachers' Summer Course of Domestic Science began its first annual session on May 31 with thirteen students. Two students will enter next week, *i. e.*, after Commencement. The class meets three hours per day and will continue till August 1. The work is under the direction of Prof. Henrietta W. Calvin and is equivalent to that given in the junior year of the regular course in domestic science.

The following persons were elected teachers of the city schools: Clara Alexander, Bertha Bisby, Minnie Spohr, Reppie Carey, C. M. Correll, Dorothy Myers, Mae Brown, Hattie Golden, Bertha Palmer, Flora Weist, Della Jones, Eli C. Freeman, Kate Manly, Floy Caldwell, Elizabeth Finlayson, Miss Shuler of Clifton, W. W. Hutto, principal of Avenue building. Six of the successful candidates are graduates of the College.

On Mondays, June 13 and 20, the Union Pacific will run special coach excursions from Manhattan to St. Louis and return, at the low rate of \$8.00. Many College people will join the excursion on the twentieth. Tickets will have final return limits of seven days, good only in day coaches on any train, regular or special.

THE INDUSTRIALIST.

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LOCAL NOTES.

Class-day exercises, June 14, 1904.

The fall term will begin on Thursday, September 22.

Professor Walters will go to St. Louis on June 18 to complete his work on the State dairy exhibit at the World's Fair.

Professor Weida, formerly of this College, has been appointed to represent Ripon College, where he is teaching at present, at the "Jubilee" of Wisconsin State University at Madison.

Druggist Carl Engel, vice-president of the State Pharmaceutical Association, informs us that their annual meeting for 1905 will be held at Manhattan, *i. e.*, at Dewey's Eureka Lake summer hotel, and that the program will include a visit to the Agricultural College.

Miss Elizabeth Finlayson, of the senior class, ought to be happy. Last week she was elected a teacher in the Manhattan city schools. This week she will receive a diploma from the State Normal School and next week she will receive a B. Sc. degree of the Kansas State Agricultural College.

George E. Hopper, contractor for the College water-works, has nearly all the iron and steel material for the plant on the ground, and a large force of men are at work digging trenches for the pipe lines and foundation for the water-works tower. Work has also been commenced on the well. He hopes to complete the whole job inside of four weeks.

The Senior-Faculty baseball game, which came off at the College arena last Monday evening, was a tie, the score being 15 to 15. There was a good deal of enthusiasm and excitement displayed, and the players as well as the attendants seemed to enjoy themselves more than usual. Some of the members of the Faculty who played are still walking stiff legged.

About five o'clock last Monday morning twenty-four of the "Ag." boys, together with Miss Ella Weeks, Doctor Brady and Assistant Kinzer, started to drive to Gifford's farm, twenty-five miles west of here. They arrived about eleven o'clock and proceeded to judge the fine herd of Shorthorn cattle. They also visited the Oakwood farm to see Mr. Avery's herd of Angus cattle. Miss Weeks made some sketches of animals for use in classes here. The party had a merry time returning, and regret only that they did not get to see the great ball game.—*Students' Herald.*

The Horticultural Department succeeded last week, between numerous rains and lots of damp spells, in making a fairly dry hay on the campus. Professor Dickens says it is good luck—nothing more or less than lucky luck.

While working at the new Auditorium last Monday, Clarence Johnson met with a severe accident. He was standing on a derrick when a bolt broke, letting the derrick fly back and causing him to fall to the ground, a distance of twelve or fourteen feet. There was a large stone directly beneath him, and when he fell he struck with his entire weight on one foot, severely spraining his ankle. No bones were broken, but Mr. Johnson suffered intense pain.

President Nichols has made arrangements with the railroad companies whereby baggage identification checks will be issued which will save much inconvenience and annoyance when so many students are leaving as at the end of a term. The Printing Department prepared the checks. Arrangements have also been made so that the students may buy tickets several days before leaving, so as to avoid a jam at the depots, and if for any reason the ticket is not used the money will be refunded upon the return of the ticket.

Nature, an English publication, in reviewing Doctor Mayo's book, "The Care of Animals," says: "Four hundred pages are filled with just the kind of information that the stock owner wishes to have. The chapters on the indications of disease and the nursing of sick animals are excellent. The descriptions of ailments, though quite free from medical terms, are pointed and so clear that even in the absence of professional assistance the farmer is likely to be able to recognize many of the diseases. The advice given is plain but guarded. The writer does not forget that there are medicines which may do harm, and he has given special prominence to the use of simple remedies; he urges the owner of valuable stock to take no risks, and when in doubt to consult a skilled veterinarian. For those unable to do this, there is a short chapter on common drugs, doses, and recipes. The book is likely to be popular in the British colonies, and its usefulness for the colonist would be increased if the sections on drugs and recipes were extended. In its present form, however, this addition to our agricultural text-books deserves popularity. To the stock-owner whose province it is to 'nurse' rather than to 'treat' the sick animal, Professor Mayo's volume will be most useful, and should be most welcome."

ALUMNI AND FORMER STUDENTS.

The daily papers announce that Elizabeth J. Agnew, '00, and Helena M. Pincomb, '01, were graduated from Teachers' College, Columbia University, June 9, with the degree of B. S. Josephine T. Berry, formerly librarian here, also received the same degree with them.

Invitations are out for the wedding of Harriet A. Vandivert, '97, who is to be married to Prof. B. L. Remick, of this institution, Thursday evening, June 23.

Minnie Copeland, '98, having completely recovered from a serious operation herself, is now back at her work of nursing. Her address is 3216 Wabash avenue, Chicago, Ill.

Mrs. R. W. Clothier and little son arrived recently from Cape Girardeau, Mo., to spend the summer with her parents, Dr. and Mrs. C. P. Blachly. Mr. Clothier, '97, has duties in a summer school for some time, but will join Mrs. Clothier later in the summer for his vacation.

The following graduates of the College have been engaged as teachers in the city schools of Manhattan for the next year: C. M. Correll, '00, Principal Central School; W. W. Hutto, '91, Principal Avenue School; Flora Wiest, '91, Wilhelmina Spohr, '97, Kate Manly, '99, and Elizabeth Finlayson, '04. Several others are former students, but did not graduate.

Prof. D. H. Otis, '92, formerly professor of animal husbandry here and now superintendent of the farms of the Labette Land Improvement Company, Oswego, Kan., has been working in hard luck this spring. In April, practically all of their fields were covered and the buildings surrounded by water from the Neosho river. Hogs and goats were kept in the second story of the barn. The men went back and forth in a boat. Over four hundred acres of crops were completely destroyed, and field work suspended nearly four weeks. Now a second flood, eighteen inches higher than the former one, is in progress, and more water expected. On the 7th about twelve hundred acres of the ranch were submerged. There are five graduates and seven former short-course students residing on the ranch, and their doors are open to representatives of the College.

J. E. Payne, '87, who has been connected with the Colorado Experiment Station for some years, has taken another position which he thinks will afford him better opportunities for development. The following extracts from his letter are of general interest: "The American Crude Rubber Company is now extracting rubber from a plant native in the mountain parks about this town, a member of the sunflower family known to botanists now as *Picradena florabunda utilis*, but once called *Actinella Richardsonii*. They produce a rubber which has been manufactured into nearly all kinds of rubber goods, and which compares well with the rubbers obtained from Central and South America. They call me their horticulturist. I have charge of the experiments in the culture of the plant. They are very liberal with me and give me entire freedom to do what I think best, telling me to spend whatever I need in the experimental work and they will pay the bills." Mr. Payne receives a considerably higher salary than he did from the Colorado Station. He is located at Buena Vista, Colo.

Historical Society

THE
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COMMENCEMENT NUMBER



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THE INDUSTRIALIST.

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MANHATTAN, KAN., JULY 2, 1904.

No. 34

THE COMMENCEMENT OF 1904.

ANOTHER College year has passed and another class of bright graduates has left the class rooms and shops to enter upon their life work on the farms, in the business houses and in the homes of Kansas. They learned during their four or five years of severe mental work and close application to duty that happiness is the result of a harmonious development and use of all the faculties of man, and that it can be earned by correct thinking and living. They have discovered that this great universe, with its constantly changing phenomena, is an endless chain of cause and effect which can be analyzed and understood and the forces of which can be utilized by the true student. They have learned to read the past and the present for the purpose of producing a better future. They will be hard workers, good citizens, and true patriots—leaders in every movement for progress—an honor to their Alma Mater.

THE SOCIETY LECTURE.

The exercises of Commencement week began with a society lecture in the College chapel on Friday evening, June 10, by the well-known characterist, Elias Day. On account of the limited capacity of the chapel, this lecture was for invited guests only. The room was filled to its last seat and the lecturer made a masterly effort in his great specialty—character painting.

BACCALAUREATE SERMON.

The baccalaureate sermon was delivered in the College chapel, Sunday afternoon, June 12, by Rev. Charles A. Campbell, pastor of the Twenty-third Avenue Presbyterian church, Denver, Colo. The sermon was an inspiring one and the reverend, who is an alumnus of this College and the son of one of our respected Manhattan citizens, was listened to by a large audience, many of whom were his old friends, former schoolmates and fellow students. He is certainly a speaker of remarkable power, possessing a happy

faculty of expression that must impress any audience with the depth of his logic. The audience on Sunday afternoon was completely carried away with the earnestness of the young pulpit orator, who in a few years has advanced to the front rank of successful workers in his church in one of the largest cities of the country. The following is a short report of his discourse, excerpted from one of the Manhattan papers:

Text, Matthew 10:18, "Freely ye have received, freely give."

"It is Jesus the Christ, the world's supreme teacher, who speaks. He is not speaking of silver or gold. There are other things than money. Our inheritances are moral and spiritual rather than material. History is largely a matter of planting and reaping. They who make the history are the planters; they who read, the reapers. We have come into the world largely fashioned for our habitation. At a tremendous cost the blessings of civilization have been brought to our doors. There is a golden glow about the names that shine through the distance, but there was no visible halo then. Then it was dig and suffer and wait and pray. There is no such thing as absolute independence or isolation in human life. No man lives to himself nor by himself nor upon himself. Each is a debtor. Each receives, each has been blessed by a great invisible host who served and are now at peace. What answer shall we make to the splendid gifts bestowed upon us? Here is the unworthy answer of selfish appropriation. It says, 'I shall pass through this world but once, therefore I shall get all I can out of it.' It is the attitude of the pirate who hoists the black flag upon the high seas. It is industrial parasitism. There is no manhood in it; there is no strength, virtue nor idealism anywhere discoverable about it. One of the divinely imposed obligations on man is the burden of work. 'If any will not work, neither shall he eat,' is the way the New Testament puts it. Modern society is imperilled by no particular 'class,' but by that degenerated manhood out of all classes which scorns work and despises the honest rough-handed toiler. There are all sorts of industrial parasites. There are drones of all conditions in the busy hives of human industry. Here belong all criminals—thieves, cheats, gamblers, and swindlers—beggars and vagrants. Here, too, belong the good-natured and good-for-nothing sons of indulgent fathers, kept alive from the cradle to the grave by wealth they never helped accumulate nor would lift a finger to

conserve. An idle man has tenfold the capacity for deviltry, debauchery and lawlessness of a busy man. Idleness is fertile soil for the breeding of the demon of envy, hatred, vice, and crime. God is the great worker, and the law of his life becomes the law of ours. Self-support is nature's demand on muscle. God never contemplated a smooth, easy, effortless life for men. Each is meant to be a producer and contributor. Labor unions spend a good deal more time devising means for decreasing their industrial capacity than for increasing their industrial efficiency—for getting more than for giving more.

"Just now there is a sad overplus of always-tired-stay-out-all-night-and-sleep-all-day sort of boys; work-three-hours-then-peter-out sort of boys; soft, flabby, nerveless, you-walk-and-I'll-ride sort of boys. They are here, but there's no room for them—they are in the way of the world's workers. One of the serious problems of the modern young man seems to be how to be busily engaged doing nothing when the train of opportunity comes thundering in. It is a good healthy conviction to possess, that a dollar deserves a dollar's worth of solid, sober work.

"In choosing your work ask other questions than 'How well does it pay?' Agassiz when in Harvard was asked to deliver a series of lectures for which ten thousand dollars was promised him. His reply was, 'Sir, I am too busy, and have more important things to do than to make money.'

"There come moments when we are made conscious of splendid personal resources and the questions arise: 'What shall I do with them all? Shall I make myself great by a selfish use of them, or the world great by an unselfish use of them? Shall I count the world as one of my assets, or be counted as one of its assets? Shall I be debtor or creditor?'

"To freely give is the essential spirit of the gospel. It is christianity's characteristic. It is life according to the royal law of love. It allies us with the heroes and patriots of earth, the servers, the great-hearts and the saints. You can find no nobler philosophy for the guidance of your life than these words of the Master."

THE MUSIC RECITAL.

Monday evening a recital was given in the College chapel by Prof. A. B. Brown, his assistants and the classes in music. All who attended this rare treat unite in calling it one of the finest, if



not the very best concert ever given at this College. Following is the program as it was rendered:

March,	"Front Section,"	<i>Reeves</i>
	College Band.	
Overture,	"Scenes from King Dodo,"	<i>Luders</i>
	College Band.	
Euphonium,	"Columbia,"	<i>Rollinson</i>
	B. R. Jackson.	
Piano,	"Valse Arabesque,"	<i>Lack</i>
	Gertrude Lill.	
Violin,	"9me Concerto,"	<i>De Beriot</i>
	R. H. Brown.	
Piano,	"Butterfly Dance,"	<i>Schutt</i>
	Anna Hostrup.	
Vocal,	"The Bandolero,"	<i>Stuart</i>
	E. J. Evans.	
Pianos,	"Concerto in A Minor,"	<i>Shumann</i>
	Eleanor E. Harris.	
	(Orchestral accompaniment on 2d Piano.)	
	R. H. Brown.	
Piano,	"Air de Ballet,"	<i>Chaminade</i>
	Bessie Nicolet.	
Piano and Organ,	"Evening Star,"	<i>Romanza</i>
	Eleanor Harris, R. H. Brown.	
Cornet,	"Addah,"	<i>Lozey</i>
	G. L. Wright.	
Piano,	"Pierrette,"	<i>Chaminade</i>
	Viola Secrest.	
Pianos (eight hands),		<i>Selected</i>
	Eleanor Harris, Bessie Nicolet, Anna Hostrup, Gertrude Lill.	

COMMENCEMENT.

Commencement Day was an ideal and typical Kansas June day. The sky was clear and bright, the air fresh, and balmy with the fragrance of blooming bushes and annuals, and hundreds of friends and relatives thronged the buildings and the campus from morning till night. For Manhattan and vicinity this day is always a holiday. All work is laid aside and every one, young and old, goes to the big picnic "on the hill" to hear the music and the address, and to see the sham battle of the cadet battalion.

The exercises began with several classic selections rendered by the orchestra in the College chapel at ten o'clock. The class—ninety-nine young men and young women—was seated on the rostrum with the Board of Regents while the Faculty, who this time were crowded off their accustomed seats, placed themselves

directly behind the orchestra. After several selections by the College orchestra, Pres. W. O. Thompson, D.D., of the Ohio State University, was introduced and delivered the annual address. His subject, "New Wines in New Bottles; or Modern Industrial Education," was handled in a masterly manner from beginning to end. The address was listened to with interest and attention from beginning to end, every one feeling that the complex subject was being analyzed and discussed by a master mind.

THE ADDRESS.

"This title for the address has been chosen for the purpose of concentrating our thought upon the teaching so clearly set forth in the passage from which it is taken, namely, the doctrine of adaptation. Or, if we prefer another statement, we may take the general principle of harmony with our environment and urge that this is a condition to be sought as desirable both for comfort and efficiency. Life should have a suitable environment, and we have been taught that a perfect correspondence with a perfect environment would itself be eternal life. Whether this is a definition of life or a description of the conditions under which life can best be realized, I need not now stop to discuss. The doctrine of adjustment, of adaptation, or of correspondence to needs as indicated by environment—this is the doctrine which I desire to emphasize as important in our educational theory and method. In plainest possible terms this means that we shall do, or attempt to do, for the individual what he needs to have done for him; or, if we think in a wider sphere of the community or of civilization, it means that we shall do, or attempt to do, in our work of education what an enlightened civilization needs or demands. This seems like a simple statement, but like many other simple statements it is far-reaching and it cannot be successfully argued that we have always consciously sought these ends. Traditional theories as to what men should do, united with the naturally conservative attitude of mind in the race and with a certain indifference toward results, have often hindered from the realization of high and elevating ideals. I mean to say that education has usually been appreciated but not always used as an efficient means to the best results. Education for education's sake is not the highest ideal. There is something beyond the processes of education that cannot be measured or defined in the terms of education. It is for

this something beyond the processes of education that I ask recognition. This is the true determining factor in what the processes of education shall be and oftentimes of what the subject-matter of education shall be. The ideal determines the real just as the journey's end determines the journey.

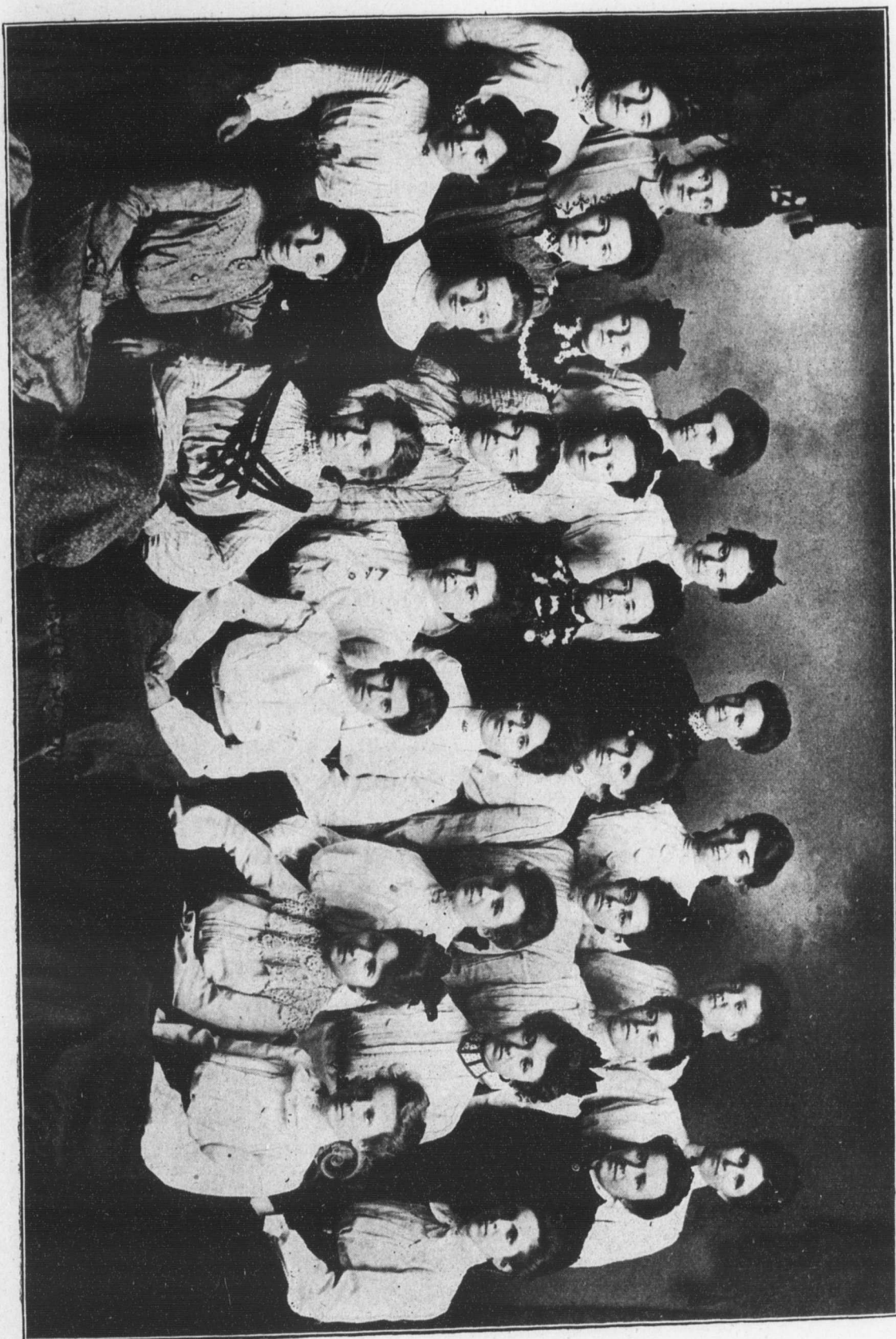
"Herbart teaches us that the 'one and the whole work of education may be summed up in the concept—morality.' He further teaches that morality is universally acknowledged as the highest aim of humanity and consequently of education. In order, however, to make morality the whole aim of humanity and education he says that an expansion of the concept is required. Doubtless his conception of education is that it culminates in character. From another point of view it may be said that the final end of religion is morality, provided that we mean by morality moral excellence. This moral excellence which is involved in any true idea of Duty would itself present a harmonious development and correlation of the human faculties and would be the highest possible expression of human character. From what may be termed the ethical and the æsthetic point of view no higher conception of education or religion could be found. It sets before us an ideal in which every other conception of life may find its true expression and its final fruition. The one thing that remains is to show that this conception has a practical working value in interpreting every form of human activity. The educational value of manual training must finally be interpreted just as the educational value of the study of Greek art would be interpreted. It makes all human activities, whether intellectual, physical, or otherwise, find their interpretation in the contribution they make to the perfection and stability of human character.

"From another point of view education is a process which prepares man to live. It looks to a greater efficiency; to greater happiness; to larger life; to more complete mastery; and to more perfect liberty. Life itself thus becomes the expression of character. From a different point of view life itself contributes toward character. From the standpoint of the individual we are aiming at the ideal of moral excellence. Everything he does, therefore, is regarded as a means to this end. The discipline, the training, the culture, the knowledge, and whatever else comes by means of the educational processes of life are given values just in proportion as they make man not only a more efficient individ-

ual but a more ethical one. From the standpoint of society, or the larger view point of civilization itself, we are looking for a condition of moral excellence that shall be in harmony with the character of the individual and thus enhance his security and in a way increase the fruit of individual character.

"The one truth that needs now to be emphasized in that life may have this dignity, this excellence and this freedom in a wider sphere than heretofore excepted. We need to rise to the conception that moral excellence is possible whether a man shoves the pen or the plane. Human labor and human industry are to be regarded as the necessary condition of growth both for the individual and for society. Under this doctrine all varieties of life find appropriate places and are capable of such direction as to make a real contribution toward the development of community or national life. When, therefore, education teaches men how to live, the question of character is practically solved and determined.

"I wish at this time to change the emphasis from the usual formula to this, *that the great end and business of education is to teach the individual and the race to live; to live efficiently; to live comfortably; to live as free people ought to live with a mastery over environment and with that freedom and liberty that follows where the supremacy of the spiritual over the material is not only a cherished theory but an accomplished fact.* To attain this conception I believe we shall need to widen our theory of education until we shall make things to be of value that are now regarded as valueless; until we shall see utility in hitherto discarded agencies and see that the opportunities of the modern world may be as heavily freighted with reward for us as those of the ancient world were for them or as they are proving yet to be for us. To put it in another way, the modern world needs interpretation just as truly as the ancient world. To fail to make this interpretation or to fail to apply it to our needs may deprive us of new possibilities quite as important as any yet realized. This, as I understand it, is what the doctrine of adaptation demands. We shall not cease to value the old for what it is or for what it may do, but we shall cease attempting to solve all problems with one formula. This adaptation of education to efficient living in a way involves the whole question of what we shall do. If education does not make life abound in all its possibilities, then something can be said against it as an efficient means of growth and development.



It is worth our while to observe that this is the substantial claim that has been made in times gone by for what we term the older education and the phase most frequently emphasized in these days when we discuss the results of education in the earlier methods.

“What we term the classical education did prepare men to live efficiently. It produced a fine type of culture that is not yet outgrown. It now produces an equally fine type of culture where it is given opportunity. The mistake we make is in the matter of time. Culture is of slow growth. Classical education can not produce its full fruits on demand. It is unreasonable to expect culture of any very fine quality in the first twenty-five years of life. This is the period of acquisition, of activity, and of foundation laying. We should be entirely satisfied to see it in growing strength and beauty during the time when life itself comes to the maximum. The later years of life, however, show usually the more perfect and mature fruits of education and culture. If you will reflect for a moment, it will be discovered that our ideals of beauty and strength are usually associated with young life, but the cultivated graces of heart and intellect come in the mature years. Here it is that classical education has borne its richest fruit. We have often judged it by the ignorance of the young collegian rather than by the refined and gracious bearing of the experienced man whose years have tested the value of his early training and given it time to bear its ripened fruit.

“My only interest at this point is to remind ourselves of the fact that the classical education from the very beginning did teach men to live so far as this problem is within the province of education. It taught them to live largely; to live efficiently; to live in the enjoyment of the best thought and in the fellowship of the best minds of the world. In the modern world the classical education has produced substantially the same results. Under this ruling conception of higher education elementary education found its mission to be the preparation of the young for such a career. It so happened that elementary education carried with it elements that may be called utilitarian in that they scattered many benefits to those whose education never reached the more advanced stage. The training in language, mathematics, something of literature and history was not wholly void of practical results, and perhaps in the earlier periods of history were quite as good a preparation

for the use and enjoyment of the world as it then was as any other education would have been. In the development under the earlier classical era there was accomplished a most important result that here may be given brief mention. Greece was the birthplace and home of classical learning. In order to rid our minds of one conception in connection with the classics I pause to remark that Greece made no study of a foreign or dead language. I mention this simply to call attention to the fact that classical education is not the study of *unknown tongues*.

"What, then, was classical education? It stood for the interpretation of life and of man, the highest expression of life. If Pope's verdict that the noblest study of mankind is man be true, then something may be said of any education that seeks to interpret man. It was in Greece that philosophy flourished. Here also art reached perfection yet unsurpassed. Oratory and debate expressed another phase of intellectual supremacy. The Greek language itself was the most accurate vehicle of thought of its day and perhaps remains so to this day. Here was evidence indisputable of a certain intellectual life that commands our attention and admiration. Homer, the great poet of all time, was to Grecian life and thought even more than Shakespeare has been to the Anglo-Saxon. Poetry is always the highest interpretation of life. Accordingly we find in Homer a picture of the passions, the struggles, the ambitions, the successes, the failures, the manners and morals, and in fact the ideals of the Greek people that furnish us with the intellectual and æsthetic interpretation of man as wrought out in their history. To this interpretation the poets have given the best expression, but it should be remembered that philosophy, art and, in short, Greek life, furnished the material which the poet put in permanent form. Grecian or classical education wrought out this result and left it to the ages as a bequest. Since then Homer has been the master among the poets as Plato has been in logic and philosophy. Classical education finds its justification, then, in the fact that it furnished an intellectual and æsthetic interpretation of life and man. It furnished the ideals for such a life and really taught man how to live. In modern days, classical education has shown the same or a similar devotion to language, philosophy, poetry, and art. This education has inspired men and taught men how to interpret the world of man. Our mistake has been the assumption that classical education

meant a more or less inhuman method of studying an unknown and little used language. We have often overlooked the fact that the study of Shakespeare is for precisely the same reason as the study of Homer and is as truly classical. The results of the earlier education are still valuable assets in our inheritance. They will remain so. The interpretation of life and of man will continue to be of vital importance and doubtless will be secured by substantially the same methods and processes in education.

"To turn aside briefly, it may be well to observe that the results as reached in the education and culture of the classics, while valuable, were insufficient. The Greeks wrought out one great problem. The Hebrew race wrought out another equally important. It was among this people that we find the spiritual conceptions to which we have fallen heir. Here it was that we learned that man was more than intellect. Here we learn that he is but little lower than the angels crowned with glory and honor. The divine sonship of man was a distinct advance upon the Grecian or classical conception. In addition to this the Hebrew people furnish us with an interpretation of nature. The poet sang that the heavens declare the glory of God and the firmament shows his handiwork. Job's imagery is still unsurpassed as furnishing a spiritual interpretation of nature. It has been commonly recognized that our Grecian inheritance has been intellectual and æsthetic while our religious and spiritual ideals have been of Hebrew origin. The Greeks have been the teachers of the world in poetry, philosophy, oratory, and art, while the Hebrew people have had a distinctly religious and spiritual message. With the advent of Christianity this message was given both breadth and intensity. Certain truths dimly apprehended stood out in clear outline. In the progress under this new force we soon learn of the influence of philosophy upon Christianity and of Christianity upon philosophy. Indeed, the field of learning and the scope of education has never since been what it was prior to the advent of the spiritual interpretation of man and nature furnished through the teachings of the Hebrew and Christian religions.

"Passing now the intervening history, we recognize that the modern world has its birth in the great movement known as the Revival of Learning. About this period many interesting features are clustered. The crusades were far-reaching in their

social and political effects. The Reformation as a religious movement is strong in its influence upon the intellectual life and upon education. The invention of gunpowder and the movable type were revolutionary in effect. The discovery of the new world proved a mighty stimulus to intellectual activity. The new movement in education was the development of science. The names of Bacon, Sir Isaac Newton, Faraday, are quickly succeeded by others. The world of science is born. Its significance lies in the fact that now a new contribution is made to the educational forces of the world. What we call in broad terms natural science, or the science of nature, was the dawn of a new world in that it brought a new message from the old world. Thus there was rounded out and brought to completeness one conception of man and nature. The intellectual interpretation of man has been supplemented by the spiritual; the spiritual interpretation of the world was the advent of science supplemented with a scientific conception of both men and nature that brought a completeness of view that made the new education possible. This large and comprehensive mission of science is important that we may have a true view of education. Through the processes of education both the individual and the race are trying to discern the true interpretation of man and nature. Science has made a significant contribution to this problem. Not only has she made possible a large amount of human activity and developed myriad forms of business and commerce but, by revealing the unity of nature, has made an interpretation possible that enhances and dignifies previous conceptions of man. It is no small wonder, therefore, that many of the greatest minds have been the enthusiastic devotees of science.

"We are now prepared to see why science had so important a place in the new and modern education. It could not be otherwise. It was fundamental to a complete view of man and of nature; it furnished a new world of thought and activity quite essential in the development of the possibilities of the new world and, therefore, of man himself.

"This position was not reached without a struggle and its full significance is not yet appreciated. At first men sneered at science. Education was supposed to be concerned with the intellect, with the ideal, and with the abstract. The war was on. Most spectacular was the conflict between theology and science. Hap-

pily that is almost forgotten and we continue to enjoy both our religion and our science. Not less real was the struggle in education. Many long debates ensued before full recognition was given. In one particular, science was like sin (if we may trust the poet)—first endured—then pitied—then embraced. It has now won its place to permanent recognition. At first it came into the colleges with suspicion and was placed in the class of electives. Later some science was required. The fear was that the world would forsake its culture and run after strange gods. The fears have not been realized and we see education not only broadened in its scope but men are awake as to the significance of the work in which they are engaged.

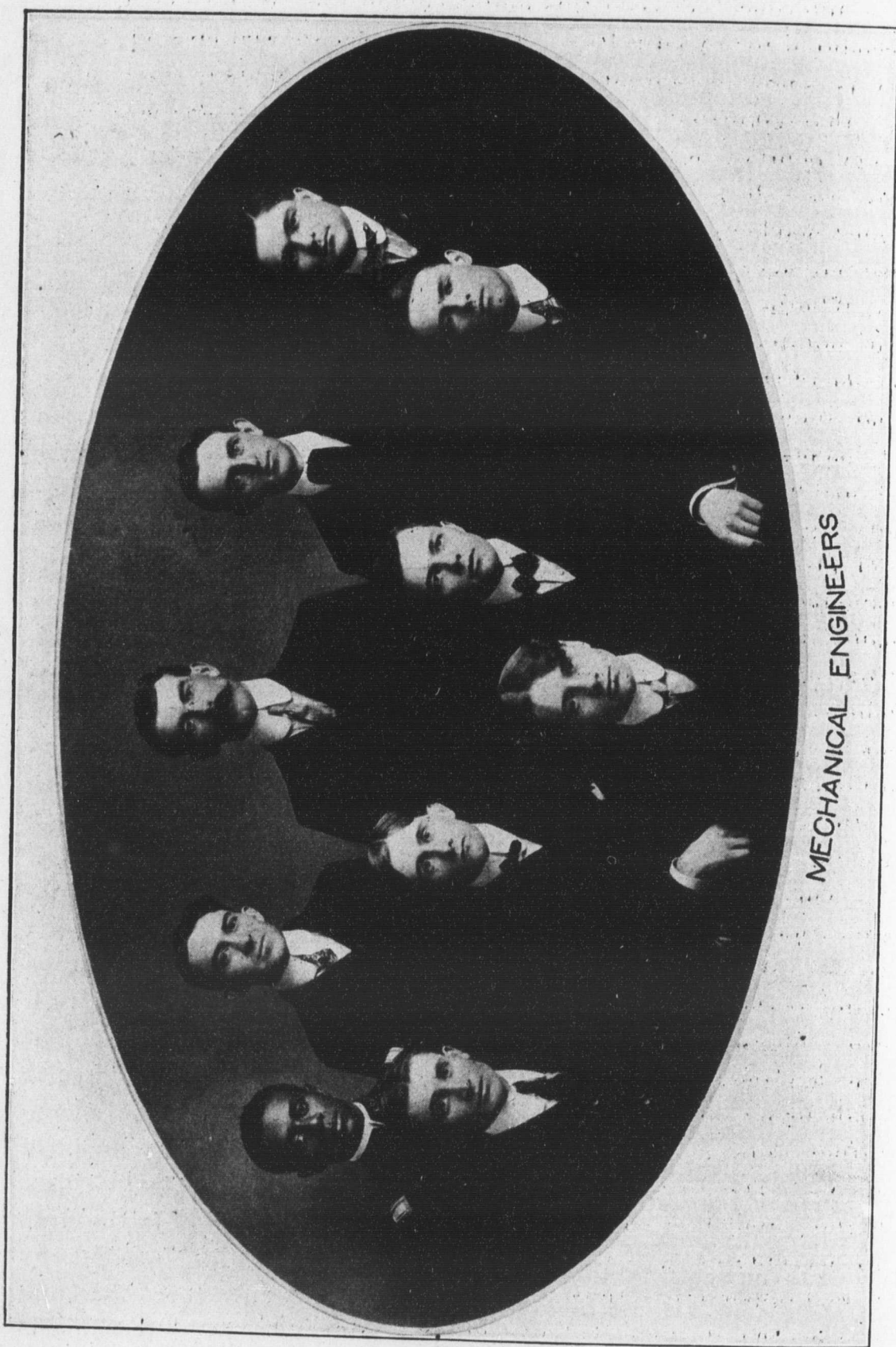
“With this broadened scope of the work of education has come a growing conviction that education should be practical. This somewhat indefinite term has been much abused, but among the rubbish that may be found under the caption of practical education it is clear that the world is demanding that education shall prepare our children to live. In some way or other people expect that time spent in the schools shall relieve the uncertainties of existence and add to the possibilities of life to such a degree as to warrant the effort and sacrifice necessary to secure an education. The more seriously we think upon the importance of education, upon its cost and labor, the more we are assured of its wisdom and the more do we fall in with the common verdict of our times. To be specific, then, what may we properly ask at the hands of the schools?

“1. I suggest first that we may rightfully ask that education shall provide for the development of the individual in his own personal powers. This, in my opinion, is a goal to be kept constantly in view. I believe there are even wider possibilities in personality than in nature. We are taught that nature is an example of unity with an infinite diversity. These two great facts give strength and beauty. This development of the individual is what relieves him from competition and opens before him a larger world. Paderewski has no competition; Beecher had none; Daniel Webster had none. These men are types of men whose individual talents have been cultivated to a high degree of excellence. Education in a way produces differences. The most highly educated people present the greatest variety in facial expressions, in tastes, in ideals, and in many other particulars.

The difference between this audience and the Filipinos is largely accounted for by education. Our ancestors showed no such variety as is now presented by their descendants. This infinite variety that educated civilization presents is most desirable from every point of view. It not only makes the world more pleasing but, even from economic grounds, may be justified as making wider markets possible and as developing a more widely diversified industry.

"Whether such a result in education may be viewed as a right, I do not discuss. I only hold it out as a result to be sought after, as one of the particular things in education. It cannot be denied that such a result will enrich both the individual and the state. It makes larger life possible. Educational method that looks toward diversity and variety would seem to increase the opportunity for compensation and also the possibilities of both pleasure and profit. I fear that in our educational work we often sacrifice valuable interests in this way. I have known cases where originality or the least indication of independence of thought would be frowned upon as 'against the rules.' If we are sacrificing possibilities, our education has not reached its maximum. We have made rapid strides in many lines, but it is not at all certain that individual results will show as great a percentage of excellence as in the simpler days when the individual was regarded as of more worth.

"This appeal for individual excellence through the processes of education is really an appeal for the highest development of civilization. We desire no drear monotony in education. We cannot endorse the doctrine that all men have equal possibilities, but we can endorse the doctrine that all men have some possibilities. The argument is that individuals shall have an education that shall bring out what is in them. We desire individual results rather than group results. The groups will take care of themselves. The excellence that has been reached in the fields of higher education has usually been attributed to the elective idea. In my judgment, it is more accurate to attribute it to the individual opportunity thus offered. If the elective idea needed any justification it would be found in the fruits of individual tastes and instruction. The practical objection to it as a popular measure is its expense and I fear, in the lower grades of education, we shall always feel the pressure that desires to keep the expense of edu-



cation as low as possible. In the long run, however, the public will see that an individual of superior excellence raises the entire mass toward his own point of advantage. It so happens that in the progress of the world it has practically all come through the inspiration of individuals. The individual leader has been able to carry his plans into execution, and by pursuing his ideals he has inspired the masses. In the work of education it will not do for us, in these days of large schools and large classes, to forget that the individual is the unit of higher importance.

"2. The second place where the principle of adaptation applies will be in the recognition of a great variety in the method of education. This variety in the method of education is necessary to carry out the principle previously stated and at the same time becomes a consequence when you admit a large variety in the life of civilization. If education develops individuality and breaks up all monotony, it makes a large variety and diversity among us. Then it follows that these varieties of tastes will demand an education that has even as great a variety. Here it is, I think, where some of us have failed to see the importance of the newer forms of education. The classical party resisted any change just as long as they could muster a majority. This was due to the naturally conservative view of mind that educated people have. The same indisposition to recognize newer forms of education has to a degree marked some of the men who protested very strongly against what they called the exclusiveness of the classical advocates. Since we have broken ground, however, it has been easier to get recognition for what was really needed. The kindergarten has had its struggle and in theory at least has won its victory. The technical schools have proved their usefulness and are steadily being accorded respectability. The movement for the so-called land-grant colleges, inaugurated by Senator Morrill in the fifties and realized in the sixties, has resulted in putting into every state of this Union one college where 'without excluding other scientific and classical studies the leading objects shall be to teach such branches of knowledge as are related to agriculture and the mechanic arts.' These institutions have been loyal to the principle on which they were founded, while they have interpreted their duties in a large and liberal spirit. The result is that much high class work has been done for liberal education of the industrial and professional classes.

They have been slowly accorded recognition at the hands of the literary and classical institutions of learning. These colleges stand for a distinct movement to bring education of a new type to the people in order that larger numbers may have the benefit of education and yet not lose their interests in the active pursuits and professions of life. It has brought to the college campus the notion that a man in overalls is as much of a gentleman as a man in a rented dress suit. In some of these institutions it is no uncommon thing to see the student come to his recitations in an automobile and don the overalls in a most democratic way in association with fellows who could not buy a bicycle even on the installment plan. We thus have a very fine example of genuinely democratic theory working itself out and proving that the real aristocracy of a country like this is to be the aristocracy of learning and of character.

"A further benefit of this new adaptation of science will be discovered when, in a few years from now, we shall find men of this sort in charge of our great industrial enterprises. There will be men with all the spirit of the new education and an intimate, practical knowledge of the details of business and machinery in charge of both our capital and our labor. Their training and experience will make them more hopeful leaders than we have had heretofore. Moreover, in the development of our civilization these same technically trained men will find themselves side by side with the best product of our literary institutions. The benefits will not all be on one side, but I am bold to affirm that both classes of institutions in the future will be required to take advice from these men who have exchanged experiences and have touched life in its most important phases.

"In the sudden and somewhat rapid development that higher education particularly has made in the last thirty years, there have been some very distressing experiences. The theory that has been announced in this address, that education should prepare men to live, has probably urged men to professional and technical education as soon as they were prepared for it. The distinct effort to make our young men find their way to professional schools and technical schools through the hallways of the literary college has been pretty vigorously presented to the public. Experience has proved that this is not practicable. Some of the colleges are now proposing to cut the course in two in order to

encourage men to take the ordinary literary degree before entering upon a professional or practical work of life. Without entering into the merits of the question whether a sophomore is entitled to a degree or whether our high schools have extended their education too far, let me make one single remark. In my humble judgment it is a fatal mistake to presume that all educated men need a literary education. This presumption is in direct violation of what seems to be common sense. Literary education will always remain for the minority; perhaps I might say for a very small minority. This, however, does not prove it to be inferior. It only proves that not every man wants or should have the same type of education. The fear that the old-fashioned college curriculum must be abandoned would never have arisen if the colleges could have remained content to train and educate a respectable number of men in literary and classical education. The desire for bigness has so taken possession of the country that people are unwilling to live in a moderate way. Experience has proved in the past twenty years that the greatest increase in higher education has been in technical and professional schools. This seems to accord with the institutions of civilization. We need a great many more men with such educations in a rapidly growing civilization like ours than we do in any other variety. Commerce, trade, business, the development of electricity, the large demand for machinery, the great questions for internal improvement in our country—all these call for educated men but not necessarily for classical scholars. It might be very well if our bridge builders could spend their evenings reading classics, but it might be as important that their evenings be spent in perusing the latest discoveries as recorded in the technical journals.

“We cannot insist with any reason that certain specified types of education shall be the conditions precedent to a useful life or to a desirable education. This same problem finds itself up for discussion in the high school. Whether our secondary schools shall undertake to prepare everybody for college is a matter of some importance. Notwithstanding the high authority that has concluded that all subjects should be taught the same way for all people, whether they are going on to higher education or whether they are not, there still remains a doubt in the minds of many men whether the conclusion is warranted. It seems to me better that the individual shall make a mistake and select the wrong

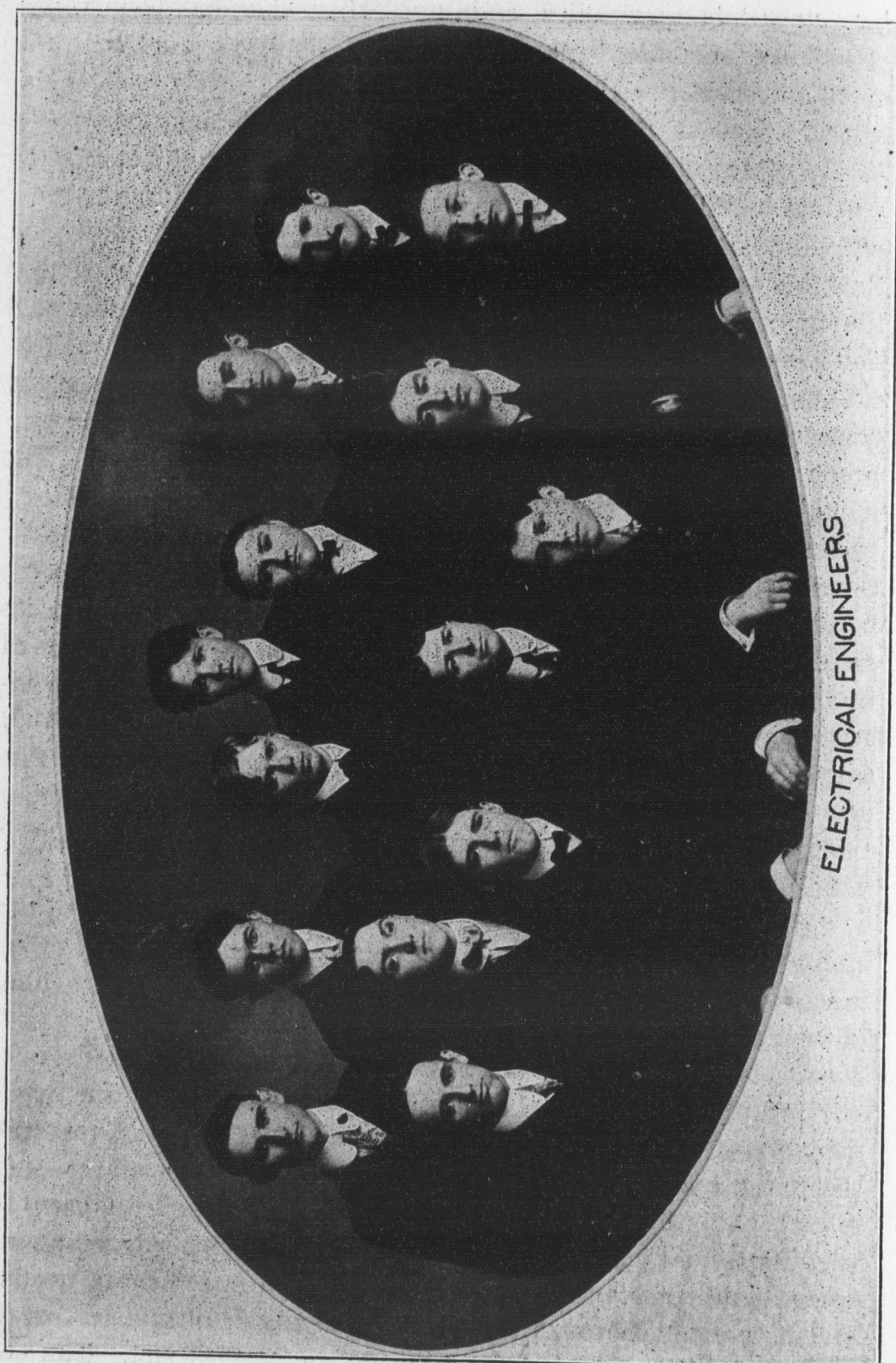
course than that the institution should make a mistake and compel large numbers to do that for which they have no special fitness. The school should be the opportunity and the responsibility, for the right use of it should rest with the students and their guardians. That is to say that both the parents and the teacher must join forces with the student in trying to discover the student's talents and aptitudes. Schools are not operated for the sake of maintaining courses of study. They are operated for the sake of training men and women. In the proper sense they are operated for the sake of developing civilization. Whatever, therefore, is demanded by sound judgment as to the needs, whether it be of culture or of skill, of art or of artisanship, should have careful consideration. The elementary schools and perhaps secondary schools shall find a very valuable service in discovering the possibilities of the pupils.

"3. I desire now to make mention of the ethical value of this doctrine of adaptation. Adaptation indicates, of course, that the initiative will be from above. It assumes that the teacher and not the scholar is devising the most efficient plan possible. It also gives due consideration to the importance of intelligent public sentiment. This harmonizes with the general principle that all the great beneficent movements have started in upper spheres. Some great soul must, missionary like, go to the field and reap the harvest. In our educational work we have heard a great deal about forcing students to do the things they ought to do. We have counseled that they should learn to like the things they do rather than to do the things they like. The one extreme has been no authority whatever; the other extreme has been the supreme authority in the student. Both these extremes are subversive of good morals, because they start with an antagonism between teacher and student. On that basis there is no opportunity for right understanding or successful work. When it is understood that the school proposes to adapt itself to the needs of the student, and that doctrine is heartily endorsed, the public, the parent, the teacher and the student are ready to coöperate in absolute harmony. It may be assumed that there will be some unpleasant places in every road selected. We cannot get rid of the undesirable phases of life, but we can have such an understanding as to arouse the interests and enthusiasm of young life in struggling with these phases.

"So long as force is the dominant idea in education, we shall have unsatisfactory ethical training. More than has been appreciated, the schools of all grades have been permeated with the spirit of coercion. Especially in our colleges has it been manifested. Sons that are sent to colleges often give faculties trouble for no other reason. In discerning the motives of parents the truth is manifest. They have tried the doctrine of force to their limit and have failed. The son is then turned over to college authorities in a spirit of despair with the remnant of a hope that they may have a better machinery for applying force to the boy. The honest and earnest desire is that the son develop into the finest type of ethical citizenship and they are quietly relying on the doctrine of force to produce it. This explains the sudden outbreak of lawlessness so often seen in freshmen at college. The technical schools of the country have very much less of it, chiefly because the elements of choice and purpose determine why they attend such schools. The quality of young manhood here is no better than elsewhere, nor is the school itself any better in its faculties and organization; but the student himself has assumed the responsibility of his position and the attitude of such an institution is that of helpfulness. Everything has been done that can be done to make this school a preparation for life. The faculty is keenly awake to the slightest suggestion for improvement from the business world, or from any source that can offer a helpful suggestion.

"What, now, in this new method of education is the place of the land-grant colleges organized under the Morrill Act? In offering a few suggestions in this line, I shall be as brief as possible, in the hope that the mere statement of a few facts will carry sufficient testimony without argument.

"And, first, I remark that these colleges all recognize the great principle of variety and adaptation in education. Indeed, this was the great reason for passing the original act. The statute was intended to introduce new lines of education and to provide what up to that date had not been provided. The needs were recognized and the Morrill Act was an attempt to meet those needs. The industrial classes in the agricultural and mechanic arts were substantially unprovided for prior to the Morrill Act. The object here was to provide a type of education that should recog-



nize great variety, and not limit the doctrine of excellence to any particular type.

“Second. These colleges recognized the importance of industries and the several pursuits of life as important in determining character. At the beginning this doctrine was not kindly received. There was a conviction that the culture necessary to character could not be secured except by the old and well-improved methods. The newer form of education, however, has proved its efficiency and already we have as a product of this education large numbers of men who reveal qualities of character quite as satisfactory as other types of education. Even if it were true, as it may be in particular instances, that a variety of education produces a variety in the type of manhood, or of character, that, in itself, will be conceded as a desirable result. So long as the types are good, no just complaint can be raised. A civilization like ours, with great varieties of occupations, of industry, of climate, of social conditions, can readily appreciate a variety in the results of education. The fact that modern education has emphasized the importance of industry seems to me to be a fundamental and far-reaching principle that must have its effect in determining national character. To this end, the colleges that are organized for the promotion of science, as related to agriculture, and the mechanic arts, and the several pursuits of life, must continue to play a most important part. They must be legitimately regarded, therefore, as a means of national development. They have met a distinct need, and already are proving themselves to be a modifying influence upon institutions already in existence. It is to be kept in mind that they were founded upon the doctrine that the public domain should serve the people. The nation, having jurisdiction over this domain, has turned its proceeds in considerable measure to the maintenance of a type of education too much neglected. Ordinarily, these institutions have called forth additional support and active coöperation of the states in which they are located. They have done much to dignify industrial education, and have gone a long way to emphasize the fact that industry is one of our great national virtues. They have not been indifferent upon the importance and dignity of scholarship, of culture, or of literary training, but have emphasized the place of industry as a promotive element in both industrial character and national development.

"Third. Another observation may be offered, namely, that the technical education offered by these institutions will be of increasing importance, in view of the rapidly increasing wealth of the country. It seems important that both the farmer and the mechanic, along with men engaged in other pursuits of life, shall be intelligent and efficient men. This will be our safe protection against the classification of society. It is absolutely impossible in a democracy to level down. It is a tremendous problem to level up. These land-grant colleges are serving a great purpose in leveling up. No nation has ever decayed or declined for lack of wealth. The classics of Greece did not save her. The strongly centralized government of Rome was not everlasting. Our country will find its future largely and more largely in the minds and hands of men who know her industries from the standpoint of science. We are growing so rapidly in wealth and all forms of material civilization that many people have not stopped to consider that an economic use of the world is imperative. There is no known limit to society's ability to enjoy the possible comforts of the world. Agriculture and mechanic arts, speaking broadly, lie at the basis not only of our wealth but of much of our enjoyment. It is to the men who have the training for which these institutions stand that we shall look in the future for preserving and enlarging those phases of life ministered to by the material advances of the world. We shall look to these men to hand the world to succeeding generations as a precious heritage rather than as a wasted and worn out patrimony.

"At the very outset, when the first Morrill bill was under consideration, important emphasis was laid upon the necessity of preserving the fertility and fruitfulness of the soil. It was recognized that this could be done only by the faithful application of scientific methods to agriculture. There are people who do not appreciate the importance of doing this, but every year makes increasing demands, and we must recognize it a wise policy for a country of such breadth as ours to be able to maintain its own existence. Further, the debate revealed the desire to provide such an education as would make men efficient in the industries. No doubt the emphasis there was upon men as producers. I desire to put the emphasis to-day quite as strongly upon men as preservers. Ignorance is a synonym for waste. Intelligence should be a synonym for economy. The locomotive, with its splendid

achievements, has for years been a very expensive necessity. Transportation will not long endure the wastefulness of these years past. More economic methods are in demand. This only leads to a scientific problem that must be solved. There are hundreds of these problems to which educated men and women must address themselves if the permanent prosperity of the world is to be preserved. I believe, therefore, that these land-grant colleges should be regarded as institutions for national preservation. More directly perhaps than any others, there is a national patriotism in them. We believe in education not only for the sake of the individual but for the sake of the nation. As a group they now comprise the strongest and most efficient agency for applied science in the nation. They are in the freshness of their youth but will in future years render a service of increasing importance, with increasing appreciation.

"Fourth. These institutions emphasize, as no others do, the intimate relation between education and life. It is sometimes said that education is a preparation for life. Then again, it is said that education is life. Without stopping to quibble about words, let us recognize the evident truth in the case. We are living in a country of unknown possibilities. Its development has been the marvel of the world. Every stage of this development has revealed the fact that the possibilities of our country have neither been realized or appreciated. The importance, in such a young and rapidly developing country, of an education that shall give opportunity to all classes of people to prepare themselves for independent living is not easily stated and is more difficult of appreciation. Industrial education recognizes the importance of a working world. It has given a new dignity to many forms of labor. In the earlier Grecian day agriculture was deemed respectable, as was also statesmanship and city living, but other forms of labor were more or less under disapproval. The callings in which a gentleman might engage were few. This notion lived a long time in the world, and even to this day some educated people believe that a gentleman, that is an educated gentleman, must confine his energies to certain callings and professions. Modern industrial education proclaims abroad the great doctrine that whoever meets the needs of society, whoever produces what the world needs, and whoever ministers to our daily comfort, is in an honorable calling.

"Moreover, industrial education has emphasized to the world the importance of life itself by showing the relation between science and life. The great questions of sanitation, the prevention of diseases, the maintenance of healthful conditions, and the application of intelligence in matters of household living—all these have combined to emphasize the importance of proper living. Modern society could not long endure without the aid of the specialist and the man of technical education. This type of education will eventually increase the efficiency not only of the soil but of the machinery and of the men of the world. It urges intelligent, educated men to address themselves to the problems that effect every-day life and make existence not only more certain but more enjoyable. This type of education casts no reflection upon other types. It merely makes a place for itself and patiently waits the recognition that is sure to come."

CONFERRING OF DEGREES.

After the address President Nichols, of this College, conferred the degree of Bachelor of Science on the class of 1904. In a few well-chosen words he thanked the class in the name of the Board and the Faculty for their hard work, good sense and excellent behavior, congratulated them on their success, and expressed the hope that they would honor their Alma Mater and the State in their life work. "By their fruits ye shall know them!" When he handed the diploma to Miss Jennie Pearl Cottrell, he stated that the young woman was the ninth child of Mr. Cottrell, of Wabaunsee, Kan., who had graduated at the Kansas State Agricultural College—a remark that was received with cheers by the audience.

The following are the names of the graduates and the titles of their theses:

Amy Alena Allen The Rise and Progress of Printing	William Burgess Banning Inspiration
Marian Allen The Sanitary Plumbing of a Modern House	Clara Florence Barnhisel Domestic Water Supply
Grace Allingham Composition and Dietetic Value of Milk	Frank Lorin Bates Study of the Negro Problem and the Difficulties of its Solution
James George Arbuthnot Henry Ward Beecher as an Orator	Louis Blaine Bender Life and Efficiency of Incandescent Lamps
Clinton Jesse Axtell The Rotary Converter	John Jeremiah Biddison Modern Governments and the Politician
Wallace W. Baird Influences Affecting the Production of Butter Fat in Dairy Cows	P. McDonald Biddison The Efficiency of the Type A. T. B. Form "D," General Electric Alternator
Flora Evacelia Ballou The Kitchen—History of Development	

Wallace Newton Birch
The Place Alfalfa Should Take in Kansas
Farming

Otis Neel Blair
Efficiency Tests on Gasoline Engines

William Armfield Boys
Insects as Fruit Pollinators

Viva Brenner
Value of Fruits and Nuts in the Dietary

Thomas Warner Buell
Deterioration of Native Pasture-lands and
the Remedies.

Clark Stewart Cole
The Distinctive Idea of Modern Education

Victor L. Cory
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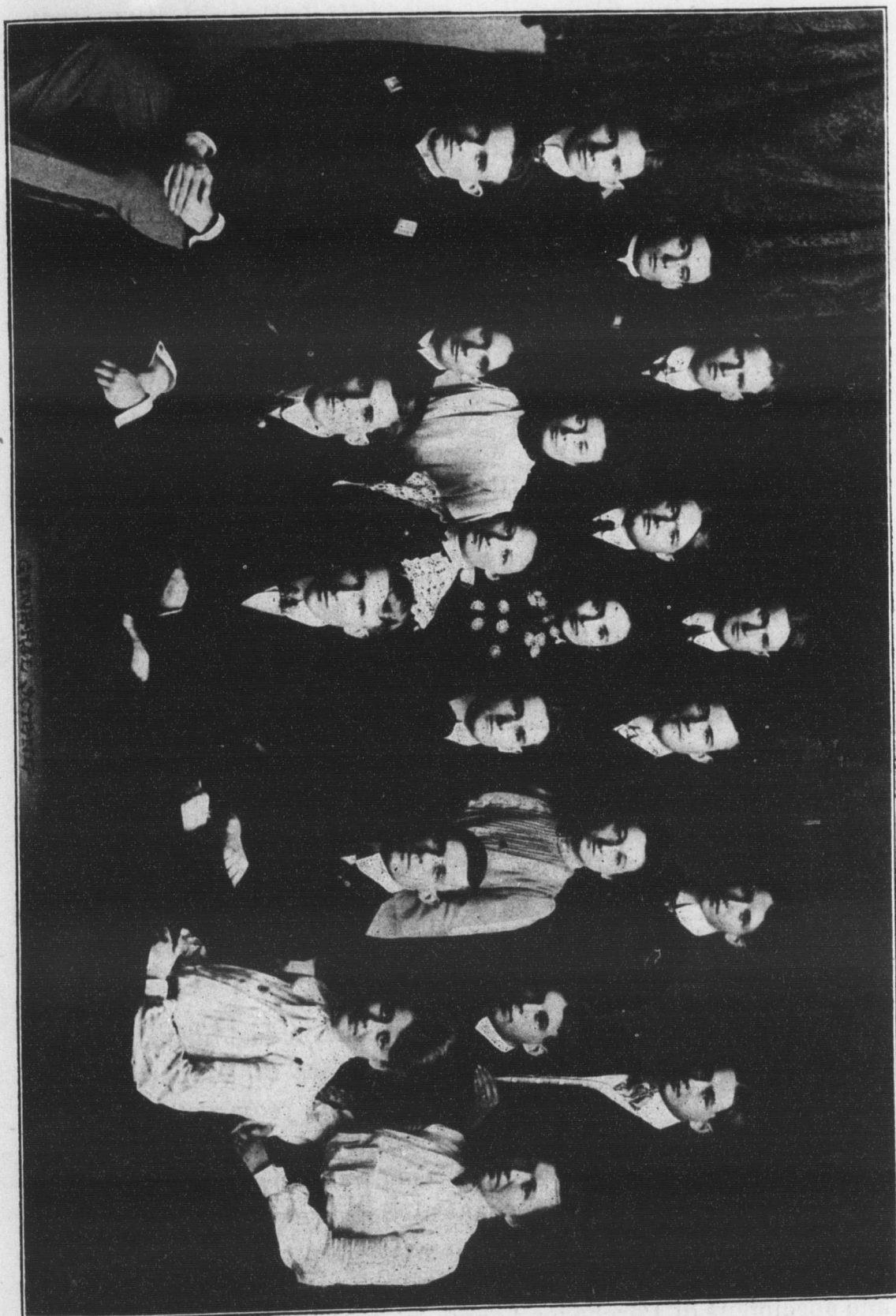
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THE BAND CONCERT.

At 2 o'clock in the afternoon the College band, under the direction of R. H. Brown, gave a concert on the east campus. The selections rendered were the following:

March,	"Constitution,"	Henninger
Overture,	"Jubel,"	Von Weber
Waltz,	"Symphia,"	Holzmann
Selection,	"Sleeping Beauty and the Beast,"	Chattaway
Dance,	"Cocoanut,"	Hermann
Finale,	"American Patrol,"	Meacham

The band consists of about fifty pieces. Its uniforms and instruments are new and neat; its music is harmonious and well accented, and its repertoire large and modern. We venture to say



that there is not a band in the State that presents a better appearance, ~~marches and drills better and plays better selections than~~ the K. S. A. C. band, and we know that the Kansas World's Fair commissioners will not make a mistake when they call on the College band to furnish the music for the Kansas building at St. Louis this summer.

THE DRILL.

At three o'clock the five companies of the College battalion gave their annual drill, followed by a sham battle, on the campus directly in front of Anderson Hall. The throng of visitors was at its height. There must have been nearly five thousand people present to witness the event. Captain Shaffer directed the attacking hosts while his adjutant commanded the battery to be stormed. The war picture was realistic indeed. The cannons boomed, the small arms rattled, the smoke drifted throughout the campus, the trumpets called; there were deeds of individual daring, enveloping movements and a final rush with fixed bayonets. The battery was taken!

THE PRESIDENT'S RECEPTION.

The festivities of Commencement week closed with a reception to invited guests by President and Mrs. Nichols, at Hotel Gillett. The spacious reception-rooms and dining-hall were tastefully decorated for the occasion, and members of the Board, the Faculty and their wives and best friends, many of the citizens of the city, and a number of guests from all parts of the State mingled with the throng and partook of light refreshments, all agreeing that the President and his bright and charming wife are ideal hosts.

EXHIBITS.

Several of the departments of instruction had prepared exhibits of the student work. The Department of Industrial Art had the walls of Professor Walters' drafting-room covered with several hundred carefully executed drawings from the different classes of his department, and the room was crowded all day with interested visitors. The Mechanical Department had samples of their wood-work and iron-work on exhibition. The chief attraction for the farmers was the barn and the cattle sheds, with their fine specimens of Percheron horses, high-grade cattle, swine, and poultry. The big four-thousand-pound steer was constantly sur-

rounded by a crowd of visitors, and there was no end to the questions asked of the patient keeper.

J. D. WALTERS.

ALUMNI MEETINGS.

At the business meeting of the Alumni Association the following officers were elected: President, Albert Dickens, '93; vice-president, Mattie Mails-Coons, '82; secretary, Margaret J. Minis, '01; treasurer, J. C. Christensen, '94.

Miss Josephine Harper, who almost completed the course when it was a six year one, and who has been for so many years the efficient and popular assistant professor of mathematics, was elected an honorary member of the association.

The principal business matter discussed was the memorial project for the new Auditorium. The committee appointed last year reported that one hundred thirty-nine graduates had replied to the circular letter printed in the INDUSTRIALIST April 23, and the summary of their votes is as follows:

1. For a memorial to George T. Fairchild 83
2. For a combined memorial to the three deceased ex-presidents: Joseph Denison, John A. Anderson, and George T. Fairchild 55
3. For a memorial to Joseph Denison 1

The choice of the eighty-three voting for the Fairchild memorial was as follows:

	First Choice.	Second Choice.
Pipe-organ	22	16
Marble bust	10	11
Window	2	10
Fairchild scholarship	12	13
Y. M. C. A. building	16	7
Portrait in oil	20	0
Hospital	0	2
Bronze bust	1	0

The choice of the fifty-five voting for the combined memorial was:

	First Choice.	Second Choice.
Pipe-organ	12	17
Marble bust	1	2
Window	2	0
Scholarships	4	19
Y. M. C. A. Building	36	5

The vote for the Denison memorial was for a portrait.

The matter was discussed at some length and the feeling as expressed seemed to be in favor of commemorating all of the deceased presidents, if any, but without necessarily combining the memorial in one object. The committee was continued with in-

TERMS AND VACATIONS.

Fall Term, 1904, Thirteen Weeks.

WEDNESDAY, SEPTEMBER 21.—Examination for admission, at nine A. M.
THURSDAY, SEPTEMBER 22.—College year begins.
TUESDAY, OCTOBER 4.—Short course in domestic science begins.
SATURDAY, NOVEMBER 4.—Mid-term examination.
THURSDAY AND FRIDAY, DECEMBER 22, 23.—Examination at close of term.

Winter Term, 1905, Twelve Weeks.

MONDAY, JANUARY 2.—Examination for admission, at nine A. M.
TUESDAY, JANUARY 3.—Winter term begins.
TUESDAY, JANUARY 3.—Short courses in agriculture and dairying begin.
SATURDAY, JANUARY 21.—Annual inter-society oratorical contest.
SATURDAY, FEBRUARY 11.—Mid-term examination.
THURSDAY AND FRIDAY, MARCH 23, 24.—Examination at close of term.

Spring Term, 1905, Eleven Weeks.

MONDAY, MARCH 27.—Examination for admission, at nine A. M.
TUESDAY, MARCH 28.—Spring term begins.
SATURDAY, MAY 6.—Mid-term examination.
TUESDAY AND WEDNESDAY, JUNE 13, 14.—Examination at close of year.
JUNE 11 to 15.—Exercises of Commencement week.
THURSDAY, JUNE 15.—Commencement at ten A. M.
JUNE 16 to SEPTEMBER 20.—Summer vacation.

Fall Term, 1905.

WEDNESDAY, SEPTEMBER 20.—Examination for admission, at nine A. M.
THURSDAY, SEPTEMBER 21.—College year begins.

KANSAS STATE AGRICULTURAL COLLEGE

FIVE FOUR-YEAR COURSES OF STUDY

Each leading to the degree of Bachelor of Science, are as follows:

1. Agriculture.
2. Domestic Science.
3. Mechanical Engineering.
4. Electrical Engineering.
5. General Science.

This Institution is supported by the general government and by the State of Kansas, and is designed, by its instruction, to promote the liberal and practical education of the industrial classes in the several pursuits of life.

All Common-school Branches are taught each term, and nearly all the first- and second-year subjects, so that it is possible for one to get nearly all subjects of the first two years by attendance during winter terms only.

FOUR SHORT COURSES

Open to students of mature age who cannot, for lack of time or money, take one of the four-year courses.

1. Apprentices, Shops, Printing, Dairying, 80 weeks.
2. Domestic Science, two fall terms of twelve weeks each.
3. Dairying, one winter term of twelve weeks.
4. Agriculture, two winter terms of twelve weeks each.

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Historical Society

VOL. 30

NO. 35

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KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

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THE INDUSTRIALIST.

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MANHATTAN, KAN., JULY 9, 1904.

No. 35

SOIL-MOISTURE STUDIES.

DURING the summer of 1903, various soil moisture experiments were carried on by the Farm Department of this Experiment Station for the purpose of studying the moisture condition of the soil under different methods of cultivation and crop rotation. The method employed in determining the amount of moisture in the soil is the gravity method. Samples of the soil of the field or plot under experiment are taken in foot sections to the depth of six feet and each sample, on being removed, is placed in a separate tray and covered at once so as to prevent loss of moisture. In order to obtain an average sample, four (duplicate) samples are usually taken, at some distance apart, of each of the first two feet and two samples are taken of each of the remaining four feet, all samples for the same foot being placed in the same tray. These trays are made of heavy tin, with closely fitting lids of the same material. They are twelve inches long, four inches wide and three inches deep. Each tray has a number stamped on its two sides, one end, and the lid, so that while in the field it is only necessary to keep a record of the foot from which the sample is taken and the number of the tray in which the sample is placed. Each tray on being filled is placed in a large, galvanized iron chest or trunk, made for the purpose. Each chest holds sixteen trays. When all of the samples are secured the chests are carried to the laboratory and each tray is carefully wiped with a cloth and then weighed upon a torsion balance, which weighs accurately to one-tenth of a gram. After removing the lids the trays are placed in a large drying oven, and there heated for from eighteen to twenty-four hours, or until the temperature in the oven becomes reasonably constant at about 110°C. , when the weighing is repeated, and from these two weighings and the weight of the tray the per cent of moisture is figured, with the dry weight of the soil used as a basis.

The tools with which the samples of soil are removed from the

earth consist of a soil sampling tube and an ordinary auger. The tube was designed by Prof. F. H. King and consists of a brass tube one inch in diameter, provided with an especially constructed steel cutting edge at one end and an enlarged steel head or cap at the other, which supports the blows of the mallet while the tube is being driven into the ground. Above the cutting edge the steel rim bulges a little so as to make a hole, when driven into the ground, a little larger than the brass tube, which keeps the tube from binding. The cutting edge or point has a bore somewhat smaller than that of the tube. Thus when the tube is driven into the earth to the depth desired, and then removed, it retains a core of earth which ordinarily drops out when the tube is inverted. This tube is used in sampling the first four feet, while the auger is used for taking the last two feet. The auger is simply the ordinary steel auger used in boring wood, to which a long shank and handle are attached.

The chief investigations of soil-moisture conditions made at this Station last season were as follows:

1. Methods of cultivation to conserve moisture, before planting corn.
2. Moisture compared in fall plowing, spring plowing, and unplowed land.
3. Moisture compared in Kafir-corn land and in prairie-grass land.
4. Moisture compared in Kafir-corn and alfalfa land.
5. Moisture compared in Kafir-corn and soy-bean land,
6. Moisture compared in wheat ground, harrowed and unharrowed.
7. A comparison of the moisture content of a large number of plots upon which were growing corn, Kafir-corn, cane, millet, flax, wheat, potatoes, soy-beans and cow-peas in rotation with wheat.
8. An experiment similar to the last one, except that the various crops were in rotation with corn.
9. A comparison of the moisture content in corn ground, listed and planted.
10. A comparison of the moisture in corn and Kafir-corn plots.
11. This experiment included twelve plots, which were divided into two equal sets or series, consisting of six plots each.

Series I was cultivated every ten days, or after each rain; however, each plot was cultivated at a different depth, except one plot, which was undisturbed as a check upon the others.

Series II. In this series all cultivation was two and one half inches deep, there also being one undisturbed check plot, but each of the tilled plots were cultivated after a different interval of time.

Other interesting lines of study have been more or less involved in this work, also, such as the movement of soil moisture by percolation and capillary action, the amount of water the different soils may contain under different physical conditions when saturated, also the amount of moisture a certain crop may extract from the soil during its growing period. Records are being kept of all this work, and the purpose is to publish in bulletin form, at a later date, such data as may appear of value. The results of the work are, as yet, too meager to draw definite conclusions, but some interesting observations have been made, a few of which are perhaps worthy of publication at this time.

GRASS, ALFALFA AND KAFIR-CORN FIELDS COMPARED.

Early in the spring of 1903, soil samples were taken from several different fields in order to compare the moisture condition of the soil. Below are given the results of two trials in which the percentage of moisture in the soil of prairie-grass and alfalfa meadows are respectively compared with that in adjacent fields which were in Kafir-corn the previous year.

Per Cent Moisture in the Soil.—Samples taken April 2, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Prairie-grass meadow....	28.8	25.3	22.5	21.1	20.7	20.5
Kafir-corn field.....	26.1	24.9	21.6	20.0	20.1	20.4
Difference.....	2.7	0.4	0.9	1.1	0.6	0.1

Average difference, 0.97 per cent in favor of grass land.

Per Cent Moisture in the Soil.—Samples taken April 2, 1903.

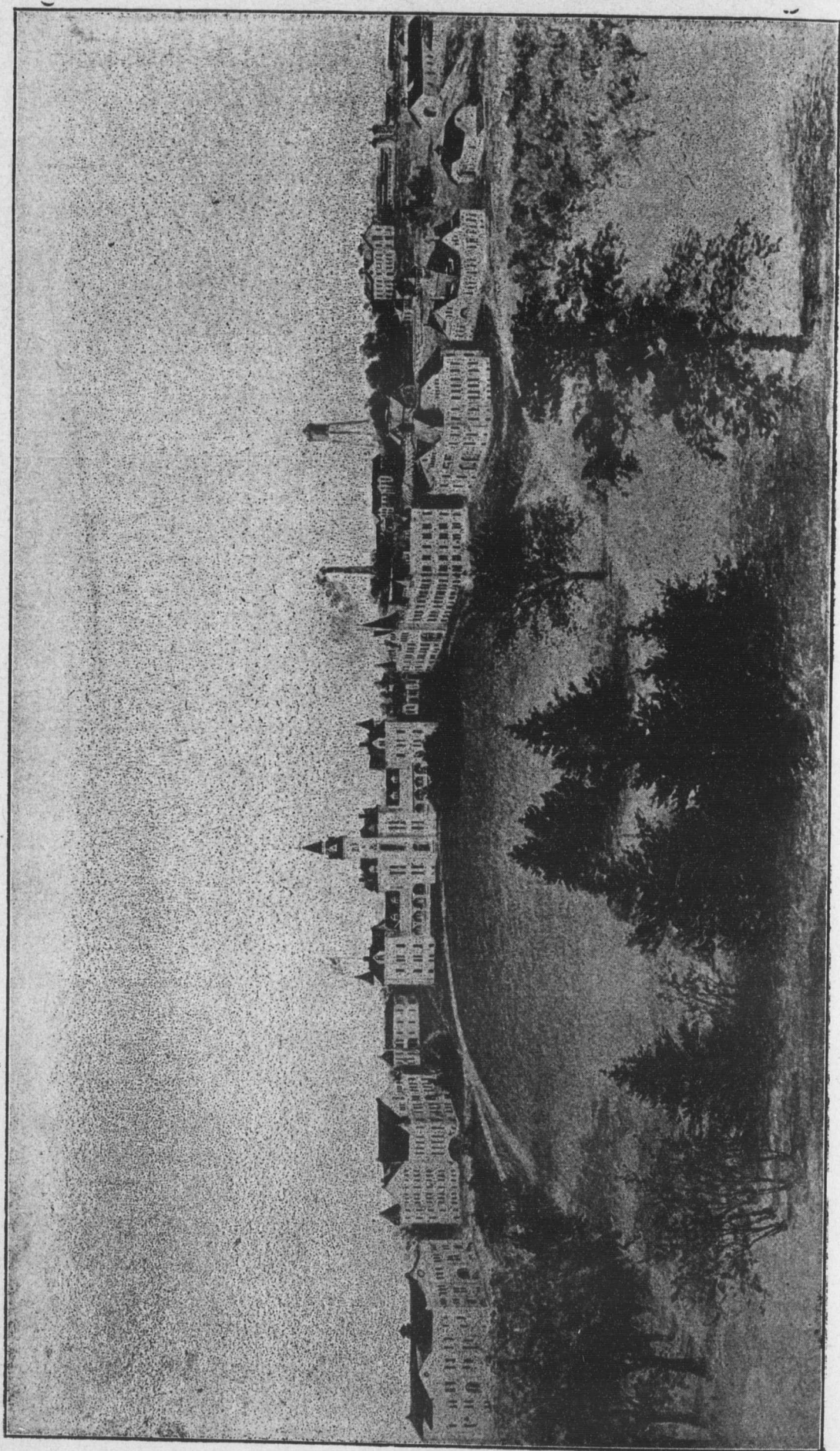
	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Alfalfa meadow.....	27.5	28.6	25.00	22.9	23.3	22.6
Kafir-corn field.....	23.3	24.9	24.65	20.1	21.1	23.5
Difference.....	4.2	3.7	0.35	2.8	2.2	-0.9

Average difference, 2.06 per cent in favor of Kafir-corn field.

□ All soil seemed to be in a favorable moisture condition last spring, but it appears that alfalfa ground contained relatively less water than the soil of other fields.

KAFIR-CORN COMPARED WITH CORN.

In the study of the moisture condition of the soil as effected by Kafir-corn compared with corn, moisture determinations were



General View.

made at intervals during the season of 1903, from duplicate pairs of plots, with the following average results:

Per Cent Moisture in the Soil.—Samples taken April 15, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plots.	29.05	28.45	25.20	24.10	24.25	22.95
Kafir-corn plots.....	28.95	27.95	24.15	24.60	24.20	22.25
Differences.....	0.10	0.50	1.05	-0.50	0.05	0.70

Average difference, 0.32 per cent in favor of corn plots.

Per Cent Moisture in the Soil.—Samples taken July 29, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plots.	16.09	23.80	23.29	21.63	21.82	20.44
Kafir-corn plots.....	18.22	25.55	23.13	23.26	21.74	21.16
Differences.....	-1.13	-1.75	0.16	-1.63	0.08	-0.72

Average difference, 0.83 per cent in favor of Kafir-corn plots.
Rain-fall from April 15 to July 29, 13.07 inches.

Per Cent Moisture in the Soil.—Samples taken September 7, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plots.....	19.82	22.59	20.64	21.72	22.75	21.39
Kafir-corn plots.....	19.58	22.06	21.68	22.87	21.28	21.37
Differences.....	0.24	0.23	-1.04	-1.15	1.47	0.02

Average difference, 0.04 per cent in favor of Kafir-corn plots.
Rain-fall from July 29 to September 7, 12.63 inches.

Per Cent Moisture in the Soil.—Samples taken September 28, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plots.....	20.28	22.07	20.75	21.21	20.53	19.79
Kafir-corn plots.....	16.16	19.09	18.50	19.42	17.59	16.57
Differences.....	4.12	2.98	2.25	1.79	2.94	3.22

Average difference, 2.88 per cent in favor of corn plots.
Rain-fall from September 7 to September 28, 1.93 inches.

The land used for the trial was Kafir-corn stubble. The field was lap-disked March 30 to April 2. The difference observed in the percentage of moisture in the soil of the several plots on April 15 was apparently due to natural physical differences in the soil and was not marked, but the results favor slightly the plots which were later planted to corn.

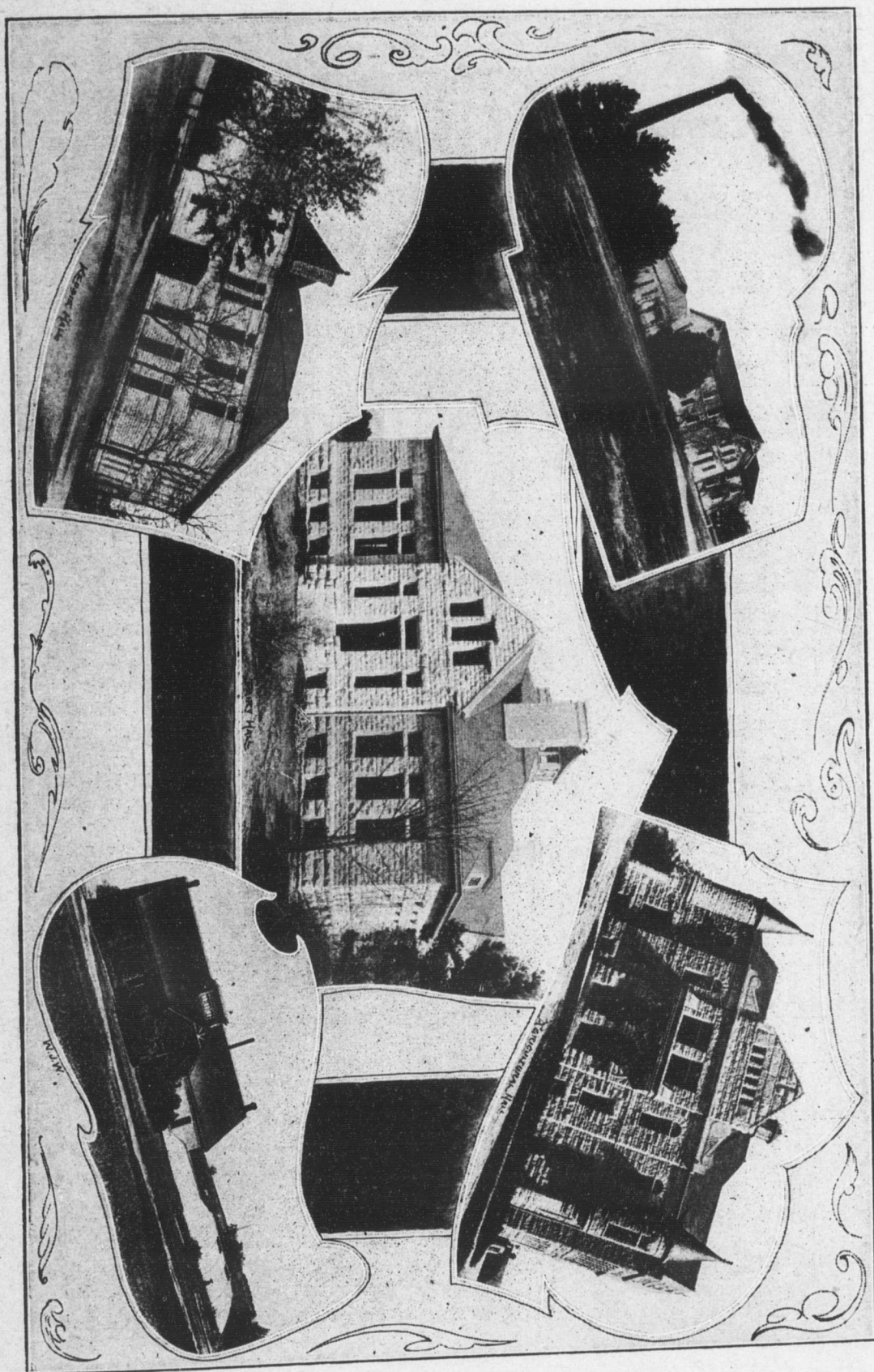
The corn was planted May 2 with the level planter. The Kafir-corn was not planted until June 9. Both crops were planted in drill rows three and one-half feet apart, and the ground was given such cultivation before planting as was required to prepare a good seed-bed. Very heavy rains fell between the intervals of planting, but it would appear that the soil of all plots was in a similar condition for receiving the water. Both crops were well cultivated and kept free from weeds. From the moisture deter-

minations made July 29, it is noticeable that the difference in moisture is in favor of the Kafir-corn plots. This may be explained by the fact that up to this time the corn had made more growth than the Kafir-corn, hence had drawn more water from the soil. When the third set of samples was taken, September 7, there was practically little difference in the per cent of moisture in the soil of the two plots. At this period the corn was nearing maturity and was using less water than was required by the crop earlier in its growth, while the Kafir-corn was still immature and growing vigorously.

The corn was cut September 22, being fully mature. The Kafir-corn was harvested for silage a few days later, being still immature, or in about the hard dough stage. The soil samples taken September 28 show that the percentage of moisture in the corn ground was much in excess of that found in the soil of the Kafir-corn plots.

The results indicate that Kafir-corn rapidly exhausts the soil moisture in the latter part of the season, leaving the ground dryer than does corn. This condition is especially noticeable in the surface soil. The season of 1903 was exceptionally wet. In a season of less rain-fall the drying effect of Kafir-corn on the soil would doubtless be more marked than was observed in the present trial. Kafir-corn has gained the reputation of being a "hard" crop on the land, and the results of the above experiments in a way support this declaration.

If the fall rains are not sufficient to supply the normal amount of moisture before winter sets in, Kafir-corn ground will be deprived of a portion of the loosening benefits of winter weathering, which are the result of the expansion and contraction of the soil by means of the freezing and thawing of the water contained therein, and thus the soil may be left in a physical condition unfavorable to the absorption of the spring rains and the development of the roots of the succeeding crops. Also because of the fact that Kafir-corn grows late into the fall, it leaves the soil lacking in available plant food, with little opportunity of gaining a sufficient amount to supply the demands of the succeeding crop. The suggestion here is that Kafir-corn should be followed the succeeding year by late-planted crops, in order to allow the soil to regain, previous to planting, its normal moisture and fertility. It was observed late in the fall that the soil of the Kafir-corn ground



was apparently firmer and more compact than that of other plots; also this observation was supported by the fact that the determination of the weight per cubic foot of the soil in the several plots showed that the dry weight of the first foot of soil in the Kafir-corn ground was greater than the weight of the soil to a like depth in other plots tested. The results of the moisture trial this spring, given below, also indicate that the rains have not percolated so readily into the soil of the Kafir-corn ground as into the soil of the corn ground.

Per Cent Moisture in the Soil.—Samples taken March 15, 1904.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plot.....	25.69	30.33	26.86	24.44	24.05	24.26
Kafir-corn plot.....	25.91	28.13	23.78	20.73	20.08	15.84
Difference.....	-0.22	2.20	3.08	3.71	3.97	8.42

Average difference, 3.53 per cent in favor of corn plots.
Rain-fall from September 28 to March 15, 7.75 inches.

Compared with the samples taken last fall, it will be seen that the Kafir-corn ground has not gained so much water as the corn ground, which indicates a less absorption of the rains, also in the Kafir-corn ground a large proportion of the water has been collected in the first two feet of soil and the moisture percentage decreases rapidly as the depth increases, while in the corn ground the moisture is held at about the same level in the lower four feet of soil.

SOWED CANE vs. CORN.

The soil conditions in this trial were similar up to planting time to those described in the preceding experiment. The corn was planted May 2, in rows, and cultivated. The cane was sown June 20, in close drills, and received no cultivation. The moisture percentages as determined at several dates are given as follows:

Per Cent Moisture in the Soil.—Samples taken April 15, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plots.....	29.05	28.45	25.20	24.10	24.25	22.95
Cane plots (sowed).....	28.90	28.80	25.28	23.60	23.60	21.40
Difference.....	0.15	-0.35	-0.08	0.50	0.65	1.55

Average difference, 0.47 per cent in favor of corn plot.

Per Cent Moisture in the Soil.—Samples taken July 31, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plots.....	16.09	23.80	23.29	21.63	21.82	20.44
Cane plots (sowed).....	20.30	24.30	22.08	23.29	22.48	21.49
Difference.....	-4.21	-0.50	1.21	-1.66	-0.66	-1.05

Average difference, 0.81 per cent in favor of cane plot.
Rain-fall from April 15 to July 31, 17.60 inches.

Per Cent Moisture in the Soil.—Samples taken September 7, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plots.....	19.82	22.29	20.64	21.72	22.75	21.39
Cane plots (sowed).....	17.83	20.87	20.29	20.46	20.33	19.80
Difference.....	1.99	1.42	0.35	1.26	2.42	1.59

Average difference, 1.50 per cent in favor of the corn plot.
Rain-fall from July 31 to September 7, 6.89 inches.

Per Cent Moisture in the Soil.—Samples taken September 28, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn plots.....	20.28	22.07	20.75	21.21	20.53	19.79
Cane plots (sowed).....	18.24	20.05	17.85	16.71	15.48	15.24
Difference.....	2.04	2.02	2.90	4.50	5.05	4.55

Average difference, 3.51 per cent in favor of corn plot.
Rain-fall from September 7 to September 28, 1.93 inches.

It will be observed that the results are similar to those discussed for "Kafir-corn compared with corn," but the difference in moisture in favor of the corn plots was even greater at the close of the season in this experiment than was found in the other trial. The relative moisture condition of the two plots this spring, no cultivation having been given, is shown in the following table:

Per Cent Moisture in the Soil.—Samples taken March 15, 1904.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Corn.....	25.69	30.33	26.86	24.44	24.05	24.26
Cane.....	25.67	28.47	24.45	22.46	19.82	19.08
Difference.....	0.02	1.86	2.41	1.98	4.13	5.18

Average difference, 2.60 per cent in favor of corn plot.
Total rain-fall from September 28, 1903, to March 15, 1904, 7.75 inches.

The cane ground appears to have regained more moisture during the winter than the Kafir-corn ground. This may have resulted from the fact that the cane ground, because of its thick stubble, had more cover than the Kafir-corn ground, and hence caught and retained the moisture better.

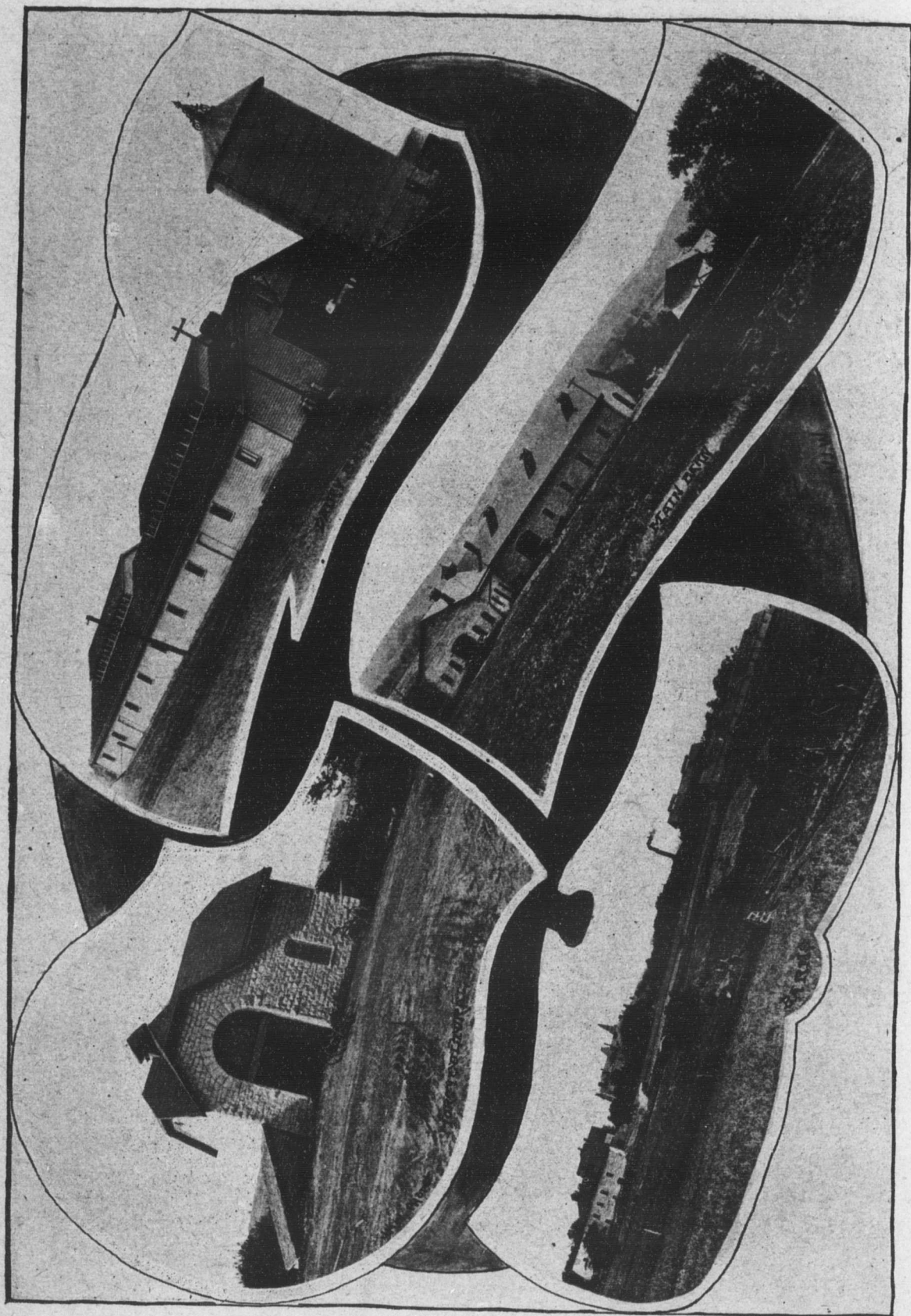
LISTED VS. LEVEL-PLANTED CORN.

The soil moisture was determined in comparable plots of listed and level-planted corn at five different dates during last season, with the following results:

Per Cent Moisture in the Soil.—Samples taken May 4, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Listed corn.....	29.0	31.1	25.7	24.8	24.1	24.0
Level-planted corn.....	27.6	30.9	26.7	25.2	26.2	24.3
Differences.....	1.4	0.2	-1.0	-0.4	-2.1	-0.3

Average difference, 0.37 per cent in favor of level-planted corn plot.



Per Cent Moisture in the Soil.—Samples taken June 4, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Listed corn.....	32.17	31.61	28.76	25.18	28.41	26.19
Level-planted corn.....	30.49	31.17	28.32	27.64	27.16
Differences.....	1.68	0.44	0.44	-2.46	-0.97

Average difference, 0.15 per cent in favor of level-planted corn plot.
Rain-fall from May 4 to June 4, 13.36 inches.

Per Cent Moisture in the Soil.—Samples taken July 1, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Listed corn.....	24.73	28.37	25.39	25.74	26.32	24.21
Level-planted corn.....	25.08	28.29	25.47	25.66	27.69	25.50
Differences.....	-0.35	0.08	-0.08	0.08	-1.37	-1.29

Average difference, 0.49 per cent in favor of level-planted corn plot.
Rain-fall from June 4 to July 1, 1903, 1.12 inches,

Per Cent Moisture in the Soil.—Samples taken July 16, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Listed corn.....	21.61	27.46	21.79	24.76	23.08	22.40
Level-planted corn.....	21.70	25.21	25.45	22.41	21.82	21.78
Differences.....	0.09	2.25	-3.66	2.35	1.26	0.62

Average difference, 0.48 per cent in favor of listed corn plot.
Rain-fall from July 1 to July 16, 2.26 inches.

Per Cent Moisture in the Soil.—Samples taken July 29, 1903.

	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Listed corn.....	14.71	22.31	23.11	21.28	20.80	20.34
Level-planted corn.....	12.63	20.10	20.81	18.35	18.84	19.07
Differences.....	2.08	2.21	2.30	2.93	1.96	1.27

Average difference, 2.12 per cent in favor of listed corn plot.
Rain-fall from July 16 to July 29, 1.54 inches.

During the first part of the season there was little difference in the percentage of moisture found in the two plots. On July 1, the average difference, 0.49 per cent, favors the level-planted corn. On July 16, the listed plot contained 0.48 per cent more water than the other, while the last determinations made, July 27, show a total average difference of 2.12 per cent—quite a marked advantage for the listed plot.

The ground used for this trial grew Kafir-corn in 1902, which was cut for fodder and removed from the land. The ground planted by the level method was plowed April 23, and prepared for planting. The adjacent plot reserved for lister planting was double disked April 24. Both plots were planted April 27 and 28. Part of the level-planted corn was cultivated shallow throughout the season and part received deep cultivation. The last cultivation was given July 2. The listed corn was harrowed early in the season, cultivated with the sled cultivator June 14, with the disk

cultivator June 22, with the Acme cultivator July 1, and with the six-shovel cultivator July 6, when the corn was laid by. It would appear that more moisture was conserved in the listed plot than in the level-planted plot after the corn was laid by. Part of this water was perhaps saved by the deeper and more perfect mulch left in the listed field by the last cultivation. The level-planted corn was left more or less ridged by the last cultivation, with the soil scooped out from between the rows, while the listed corn ground was left practically level with a good depth of soil mulch clear up to the hill. The early part of the season of 1903 was too wet and cold for listed corn, hence the level-planted corn thrived best and produced the largest crop by about eight bushels per acre, the comparative yields being 52.3 and 44.4 bushels per acre, respectfully. The larger crop would tend to exhaust more soil moisture, which may account partly for the lower per cent in the level-planted plot. No moisture determinations were made at the close of the season.

SOIL MOISTURE AS EFFECTED BY DEEP AND SHALLOW CULTIVATION.

In a trial of deep and shallow cultivation of corn, soil moisture determinations were made at two different dates, *i. e.*, at the date the different cultivations were begun and again about a week after the corn was laid by. The first samples taken June 9, showed about the same percentage of moisture in the soil of each plot. The results of the tests, on July 16, are given in the following tables:

Per Cent Moisture in the Soil.—Samples taken July 16, 1903.

Kind of cultivation.	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Shallow.....	22.15	26.55	25.05	22.99	22.54	22.63
Deep.....	21.52	25.21	27.59	23.99	22.41	22.08
Difference.....	0.63	1.34	-2.54	-1.00	0.13	0.55

Average difference, 0.15 per cent in favor of deep cultivation.

Per Cent Moisture in the Soil.—Samples taken July 16, 1903.

Kind of cultivation.	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.
Deep early, shallow late	21.12	20.38	23.02	21.24	21.05	21.64
Shallow early, deep late	22.03	28.72	26.17	21.44	21.28	20.77
Differences.....	-0.91	-8.34	-3.15	-0.20	-0.23	0.87

Average difference, 1.99 per cent in favor of shallow early and deep late cultivation.

The season of 1903 was a wet one until near the close of the season and no marked difference in the soil moisture appeared at the date upon which the samples were taken. The results favor slightly the deep cultivation, especially the deep cultivation the last time as opposed to shallow cultivation the last time. No

moisture determinations were made at the close of the season. The yield of corn was practically the same from each plot.

MOISTURE IN THE SOIL AT THE CLOSE OF THE SEASON.

In order to compare the moisture condition of the soil of several plots at the close of the season, the following table has been prepared:

Per Cent Moisture in the Soil — Samples taken September 28, 1903.

Crop grown on plot.	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.	Average difference compared with corn plot.
Corn.....	20.28	22.07	20.75	21.21	20.53	19.79
Kafir-corn.....	16.16	19.09	18.50	19.42	17.59	16.57	—2.88
Sorghum (sowed)	18.24	20.05	17.85	16.71	15.48	15.24	—3.51
Soy-beans.....	22.07	24.61	21.37	24.01	21.95	21.12	1.75

The plots which had produced a crop of sowed cane showed the least per cent of moisture, while the Kafir-corn plots were next lowest. The soy-beans plots, however, contained 1.75 per cent more moisture than the corn plots and 4.63 per cent more than the Kafir corn plots.

MOISTURE IN THE SOIL EARLY IN THE SPRING, AT THE BEGINNING OF THE SEASON.

Early in the spring of 1904, samples were taken from adjacent plots which grew different crops the previous year. The land was all unplowed at the date the samples were taken and had received no treatment since the harvesting of the 1903 crop, except that the grain plots were mowed in early fall to destroy the weeds.

In the following table is given the average percentages of moisture found in each foot of soil, to the depth of six feet, in duplicate plots (except potatoes). The plots are arranged in the order of their total moisture content, and all plots are compared with the corn plot, as regards the percentage of moisture found in the soil.

Per Cent Moisture in the Soil.—Samples taken March 14, 1904.

Crop in 1903.	1st foot.	2d foot.	3d foot.	4th foot.	5th foot.	6th foot.	Average difference compared with corn plot.
Corn.....	25.69	30.33	26.86	24.44	24.05	24.36
Potatoes.....	26.01	33.11	24.55	24.58	21.39	18.19	—1.30
Millet	26.07	28.81	26.71	23.17	21.58	20.88	—1.40
Soy-beans.....	25.20	28.13	24.56	23.20	21.54	20.26	—2.11
Cane (sowed).....	25.67	28.47	21.45	22.46	19.82	19.08	—2.61
Oats.....	26.09	25.45	20.25	18.61	18.96	28.78	—2.91
Wheat.....	25.16	27.14	22.54	21.97	20.56	20.52	—2.97
Barley.....	25.69	27.11	23.29	18.93	20.81	20.43	—3.23
Emmer.....	26.56	28.23	22.53	21.00	17.94	19.22	—3.36
Flax.....	26.15	27.12	22.37	20.69	20.30	18.39	—3.43
Kafir-corn.....	25.91	28.13	23.78	20.73	20.08	15.84	—3.53

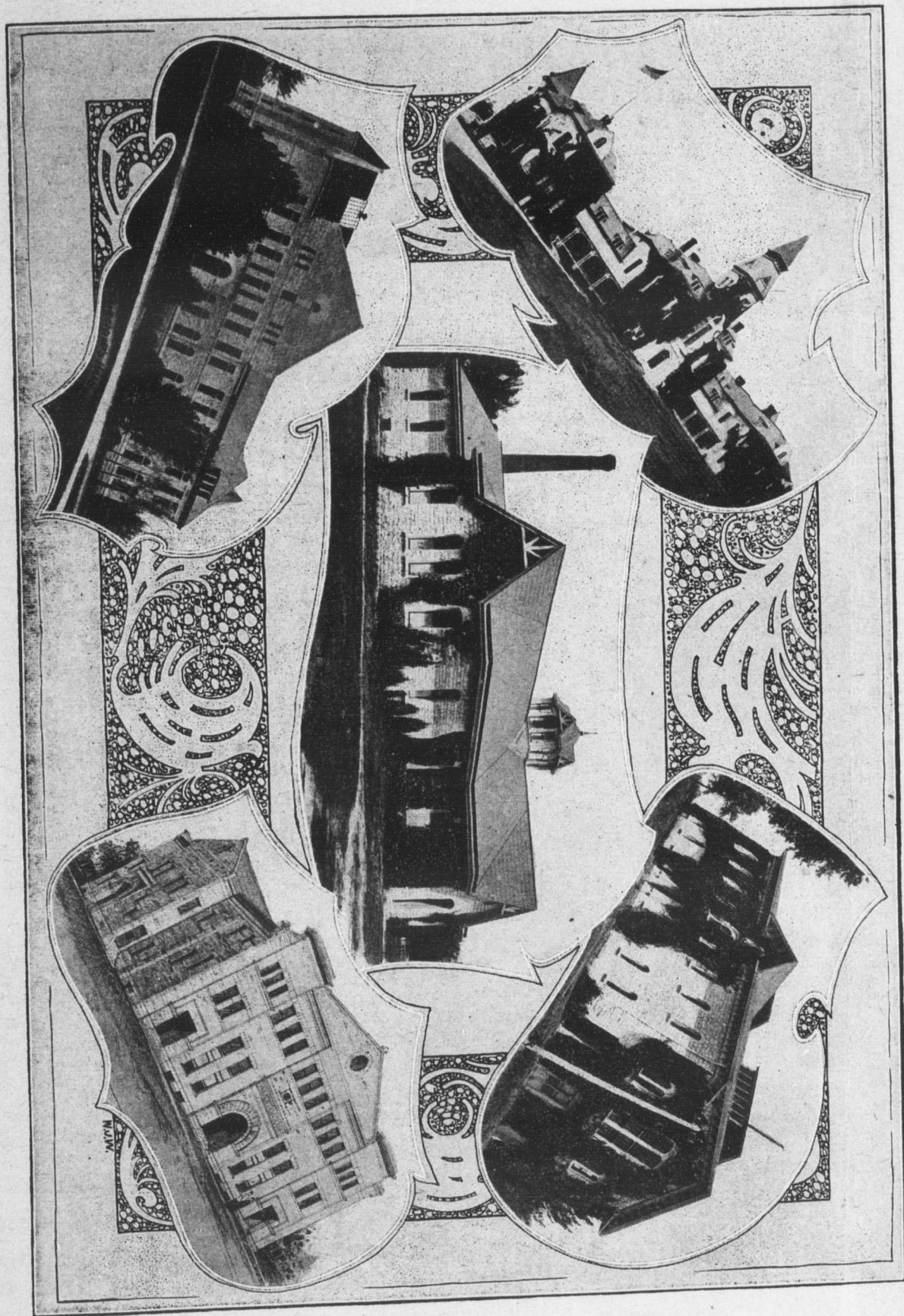
The ground which grew cultivated crops last season showed the largest amount of moisture in the soil; the millet ground also ranked high. The grain ground contained 2.91 to 3.43 per cent less moisture than the corn ground; the flax plot ranking lowest. The Kafir-corn ground contained less moisture than any other plot, averaging 3.53 per cent less than the percentage found in the corn ground. The grain plots showed a more even distribution of moisture throughout the several feet than the cane or Kafir-corn plots, the Kafir-corn ground being especially low in moisture in the deeper soil. The corn plot not only contained a higher total average per cent of moisture than any other plot, but contained a uniformly high percentage of moisture in each foot of soil. The potato plot contained a higher percentage of moisture in the first two feet of soil than any other plot.

I wish to add that these experiments were planned and have been carried on under the direction of Prof. A. M. Ten Eyck, who has also very greatly assisted me in the preparation of this paper.

C. H. KYLE,
Assistant in Farm Department.



Taking Soil Samples.



FARMERS' INSTITUTES, 1903-'04.

The following list includes the farmers' institutes attended by College or Experiment Station officers the past year. In a few cases not here included appointments were made which were not filled because of floods or other events beyond control.

- Rosedale, Wyandotte county, July 18. Dickens.
 Cadmus, Linn county, July 21. Ten Eyck.
 Madison, Greenwood county, July 21. Roberts.
 Ash Rock, Rooks county, July 29. Barnes.
 Halstead, Harvey county, August 1. Popenoe and Willard.
 Columbus, Cherokee county, August 5 and 6. Popenoe and Willard.
 Altamont, Labette county, August 7 and 8. Popenoe and Willard.
 Sibley, Douglas county, August 20. Roberts and Greene.
 Burlingame, Osage county, August 20. Mayo.
 White City, Morris county, August 20. Walters.
 Highland, Doniphan county, August 21 and 22. Greene.
 Summerfield, Marshall county, August 25. Mrs. Calvin and Ten Eyck.
 Sigel Grove, Douglas county, August 27. Walters and Miss Minis.
 New Lancaster, Miami county, August 29. Walters and Mrs. Calvin.
 Denison, Jackson county, September 1 and 2. Walters and Wheeler.
 Mulvane, Sumner county, September 2. Greene.
 Riley, Riley county, September 3 and 4. Shoesmith and Wheeler.
 Higginsville, Butler county, September 3. Shaw and Miss Minis.
 Jennings, Decatur county, September 5. Mrs. Calvin.
 Lyndon, Osage county, September 5. Ten Eyck.
 Iola, Allen county, September 22, 23 and 24. Shoesmith.
 Winchester, Jefferson county, September 24. Dickens and Miss Minis.
 Hays, Ellis county, October 1. Ten Eyck.
 Girard, Crawford county, October 9 and 10. Dickens and Kinzer.
 Wakefield, Clay county, October 9. Ten Eyck, Wheeler and Miss Minis.
 Burrton, Harvey county, October 30 and 31. Ten Eyck and Roberts.
 Indian Creek, Shawnee county, November 5 and 6. Erf and Mayo.
 Valley Falls, Jefferson county, November 26. Miss Rice.
 Star Church, near Jewell, Jewell county, November 28. Shoesmith and Miss Minis.
 Oak Grange, Shawnee county, December 1 and 2. Dickens and Ten Eyck.
 Hutchinson, Reno county, December 2 and 3. Barnes and Ten Eyck.
 Hackney, Cowley county, December 3 and 4. Barnes.
 Caldwell, Sumner county, December 4 and 5. Barnes and Ten Eyck.
 Union Center, Wabaunsee county, December 12. Shaw and Wheeler.
 Gridley, Coffee county, January 5. Dickens and Ten Eyck.
 Seneca, Nemaha county, January 20 and 21. Ten Eyck and Eastman.
 Stockton, Rooks county, January 20 and 21. Dickens and Miss Rose.
 Hiawatha, Brown county, January 21 and 22. Roberts, Ten Eyck and Miss Minis.
 Overbrook, Osage county, January 29 and 30. Willard and Dickens.
 Randolph, Riley county, January 30. Ten Eyck.
 Rome, Sumner county, February 4 and 5. Dickens and Barnes.
 Berryton, Shawnee county, February 4 and 5. Ten Eyck and Miss Rose.
 Gardner, Johnson county, February 4 and 5. Popenoe and Miss Minis.

Belleville, Republic county, February 10 and 11. Mrs. Calvin and Ten Eyck.
Hanover, Washington county, February 12 and 13. Dickens and Walters.
Peabody, Marion county, February 12 and 13. Roberts and Ten Eyck.
Holton, Jackson county, February 17 and 18. Erf and Ten Eyck.
Oneida, Nemaha county, February 18 and 19. Mrs. Calvin and Dean.
Waverly, Coffee county, February 19 and 20. Ten Eyck and Wheeler.
Russell, Russell county, February 24. Erf.
Arkansas City, Cowley county, February 24 and 25. Willard and Miss Rose.
Norcatur, Decatur, county, February 26 and 27. Erf and Shoesmith.
Paxico, Wabaunsee county, February 27. Ten Eyck and Mayo.
Excelsior Schoolhouse, near Glen Elder, Mitchell county, March 1. Erf and Barnes.
Blue Hill, Mitchell county, March 2. Erf and Barnes.
Yorktown, Mitchell county, March 3. Erf and Barnes.
Paxico, Wabaunsee county, April 9. Ten Eyck.
McCracken, Rush county, June 24. Dickens.

The total number held was fifty-eight, which is a smaller number than during the preceding year. The tax upon the time of teachers and Station men if much institute work is done is such that we have not felt justified in making much special effort in this direction with our limited available force. We have especially avoided organizing speaking tours in which the institute programs consisted only of one or more addresses by College men, believing that the best institute work is done when the farmers themselves in the respective localities furnish at least one-half of the program.

A circular on farmers' institutes has been issued giving full information concerning our relation to this work, hints on organizing and conducting institutes, how to obtain assistance from the College, etc. A suggestion as to constitution and by-laws for an institute organization has been printed also. Either of these publications may be had on application. Localities desiring speakers should make application at least a month in advance of the date desired for the institute. Address: Chairman Committee on Farmers' Institutes, Manhattan, Kan.

J. T. WILLARD.

Both the Rock Island and Union Pacific have extended the sale of cheap World's Fair tickets through July. Each Monday during the month tickets may be bought for \$8, good for seven days, and a \$11.30 rate, good for fifteen days, may be had any day during the month. There seems no reasonable excuse why everybody should not go and see the great fair.

THE INDUSTRIALIST.

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LOCAL NOTES.

The Auditorium is all inclosed.

Work on the College water-works has been progressing slowly.

Regent Fairchild, being detained by railroad washouts, visited the College this week.

Ex-Pres. Thos. E. Will is associate editor of *Social Ethics*, published at Wichita, by Granville Lowther.

So far as we can learn, the high waters have not been very disastrous in and around Manhattan. Comparatively little bottom-land has been damaged. The greatest loss has been caused by soft fields, making it impossible for farmers to take machines in to cut the ripened grain.

Miss Harriet Howell, formerly superintendent of sewing here, visited the College and friends for a week soon after Commencement, and then went to St. Louis to spend a month. She has resigned her position at the Throop Polytechnic Institute, Pasadena, Cal., in order to accept a more lucrative and responsible position in the State Polytechnic School at San Luis Obispo, Cal.

President Nichols returned from St. Louis June 30 after a ten-days' trip, the prime object of which was to set the picture-exhibiting machine in operation. This he succeeded in doing without interference on the part of any union, and it now makes the most attractive feature in the Kansas educational exhibit. He also attended meetings of the National Educational Association, and, to a certain extent, compared the great Fair with its great predecessor at Chicago.

In the "Report of the Director of the Office of Experiment Stations for 1903" just issued, the following general comment is made on this Station: "The Kansas Station is doing considerable useful work, but needs more generous support in order to make its investigations commensurate with the agricultural interests of the State. With the rapid growth of the College with which the Station is connected, and increased interest in the farmers' institutes in the State, the duties of the men on the Station staff have become too numerous and severe to permit them to give as much time and energy to the Station work as is most desirable. This could be remedied if the institution were more liberally supplied with funds, so that the Station staff could be organized primarily with reference to the work of investigating agricultural problems."

Director Willard visited the Fort Hays Branch Experiment Station last week. He found the wheat crop good, though not equal to last year. There was some danger that continued rains would interfere with the harvest. Four College students are helping in that work. Crops planted for irrigation experiments were making a good showing, but thus far rainfall has sufficed. Corn was higher than a man's head and tasseling out. Barley was rather poor in most cases and macaroni wheat promised well. On the same trip a visit was paid to the experiments at McPherson which are being conducted jointly by the Station and the Bureau of Plant Industry. By the exercise of commendable energy Mr. Fitz had just succeeded in getting some of the largest plats cut the first day that a binder could be taken on the field. The next night a heavy rain came. This has been followed by others, and it is probable that much of the uncut grain will be lost. There are about two thousand separate plantings there. Most of these are of imported varieties or hybrids originated by this Station or the Department of Agriculture.

ALUMNI AND FORMER STUDENTS.

May Bowen-Schoonover, '96, and Mr. Schoonover are happy in the birth of a daughter, June 27.

Miss Flora Rose, '04, assistant in domestic science, with her mother will spend the summer in Rossland, B. C.

Maud Gardiner, '93, has resigned her position as professor of domestic economy in the Oklahoma Agricultural College.

H. P. Richards, '02, has recently been put in charge of testing the materials of construction used along the Santa Fe railway. He visited College while in Manhattan, a few days before Commencement.

G. L. Christensen, '94, instructor in mechanical engineering in the Michigan School of Mines, Houghton, Mich., made a short visit here recently. He is planning to take up study with reference to the Master's degree.

H. M. Bainer, '00, received the degree of Master of Science in Agriculture from the Iowa State College at its last Commencement. He will be one of the instructors in the department of farm mechanics there next year.

W. E. Thackrey, '96, visited the College for the first time in five years this week. He is now in charge of the manual training in the Indian school at Fort Shaw, Mont. Like all of the others, he notices great changes on the campus since he left.

R. S. Kellogg, '96, assistant in forestry, United States Department of Agriculture, visited the College just before Commencement. He was on his way to Illinois, where he will be in charge of a party of five making a forest survey of that state.

Prof. G. H. Failyer, '77, chemist of the Bureau of Soils, United States Department of Agriculture, is spending his vacation with his family here.

Adelaide Strite, '01, has been elected to teach in the Manhattan city schools to fill the place left vacant by Miss Finlayson, '04, who has a position in Christ's Hospital, Topeka.

Miss Elizabeth Finlayson, '04, is now employed at Christ's Hospital, Topeka. She is in charge of the diet kitchen and is responsible for the trays of food as served to the patients.

E. C. Gasser, third-year in 1899, formerly foreman of the blacksmith shop here and now instructor in blacksmithing at the Iowa State College, visited us soon after Commencement. He will return to his work early in order to prepare for the next term.

Mary Pierce-Van Zile, widow of Gilbert Van Zile, '90, second-year student in 1891, was graduated from the domestic science course of the Iowa State College recently. During her senior year she was also an instructor in the department of domestic science there.

R. F. Bourne, '03, Bessie Bourne, '02, and E. H. Hodgson, '03, visited St. Louis after Commencement. Mr. Bourne stopped off at Kansas City and visited with several alumni there. He will be at home for the summer, but expects to enter the Veterinary College in Kansas City in the fall.

L. S. Edwards, '03, took advantage of the Fourth of July rates to visit the College and friends here. Mr. Edwards is one of the force on the Deming ranch, in Labette county, and reports the condition of farmers in the Neosho valley as discouraging, they having had two floods this season.

J. B. Harman, '95, writes from Colorado City, Colo., for his INDUSTRIALIST. He says: "We are for the present located here and are enjoying the mineral waters and mountain scenery. We have not seen the INDUSTRIALIST for some weeks and are lost without it, for we always look forward to its appearance."

D. M. Ladd, '01, returned recently to Manhattan to remain for some time with his mother. For the past two years he has been in Nevada and California, part of the time with other members of his class at Palo Alto, where Messrs. Doane, Martinson and Haselwood have been in the University. In the fall Mr. Ladd expects to enter a medical school in Chicago.

To Rev. Chas. A. Campbell, '91, belongs the honor of having attracted to the College chapel an attendance larger than could be seated, a condition that seldom occurs in connection with the baccalaureate sermon. Mr. Campbell's address was most favorably commented upon by every one. His theme was the gospel of one's duty to work, and that as we had had much done for us we should do much for others.

Alma Mater has two more grandchildren in John B. Griffing, '04, son of John S. Griffing, '77, and Augusta Griffing, '04, daughter of Wm. J. Griffing, '83. There are now five in this second generation, the other three being May Bowen-Schoonover, '96, Corinne Failyer, '03, and Maude I. Failyer, '03.

Mrs. Lucie Wyatt-Wilson, '01, of Westmoreland, where Doctor Wilson practices medicine, drove over to Manhattan recently and visited classmates and friends in town, staying while here with the Misses O'Daniel. She visited College on the 2nd and when in Physical Science Hall asked: "Where is our 1901 clock? I thought it was to be in this building, but I do not see it."

Geo. W. Finley, '96, with his wife, who was Dora Shartel, and their baby daughter are visiting his parents and observing the development of the College that has taken place. With Miss Lena Finley, '05, they will go later to visit their sister, Lottie Finley-Johnson, student in 1890, who resides in the southeastern part of the State. Mr. Finley is professor of mathematics in the preparatory school of the University of Oklahoma.

O. R. Wakefield, '04, and Henrietta Evans, second year in 1896, were married at 8 o'clock Wednesday evening, June 29, by Rev. O. B. Thurston, at the residence of the bride's parents. A large company of guests were present, including a number from out of town. Mr. and Mrs. Wakefield went to Wilsey to visit Mr. Wakefield's parents and later they will go to Chicago, where Mr. Wakefield has a position as instructor in the College of Physicians and Surgeons.

Dr. I. B. Parker, '92, visited the College for the first time since his graduation, June 28. He now resides at Grant's Pass, Ore., and is prospering in the practice of his profession as physician and surgeon, and also in lumbering and lumber manufacture, in which he is associated with his brother-in-law, M. C. Findley, student in 1893. Dr. Parker almost needed a guide to find the College from the new railroad station and could scarcely recognize things on the campus.

Mr. Jack Harrison ['88], post-office inspector in charge of the Kansas City office, is to be recalled to Washington and made chief inspector, taking the place of Colonel Cochran, recently made purchasing agent for the post-office department. The change is expected to take place about July 1. Harrison is a Kansas man and was formerly a resident of Salina, where he became well acquainted with J. L. Bristow, at that time running a newspaper there. When the Cuban postal frauds were discovered and the President instructed General Bristow to go to Havana to make an investigation, Harrison was selected as his assistant. His work on the island was highly satisfactory and his return was followed by promotion to inspector in charge of the Kansas City office. His appointment as chief inspector is believed to be due to the confidence reposed in him by General Bristow.—*Topeka Herald*.

Prof. W. H. Olin, a graduate of the Kansas State Agricultural College ['89], later an assistant in the Agricultural Department, and still later assistant agronomist at the Iowa Agricultural College, has resigned at the Iowa institution and has accepted the chair of agronomy at the Colorado Agricultural College. Professor Olin is a vigorous worker, possessed of that contagious enthusiasm which makes him at once a power and an inspiration to those with whom he comes in contact. Colorado is congratulated on securing his services.—*Kansas Farmer*.

A pretty wedding occurred Wednesday evening at six o'clock, at the home of Mr. and Mrs. Jacob Brenner, of College Hill, which united their daughter, Miss Viva Brenner ['04] and Mr. Frank Morrison, of Golden, Colo. The rooms were prettily decorated with daisies. The bride and groom stood unattended under a beautiful arch of daisies while Rev. M. E. Goddard, assisted by Rev. W. C. Hanson, performed the ceremony. Miss Edna Brenner, sister of the bride, sang "My Dream of Thee," accompanied on the organ by Miss May Swingle. After congratulations a two-course luncheon was served by Miss Edna Brenner and Miss Alice O'Brien. The bride wore a gown of Persian lawn with lace and ribbon trimmings. She was a member of this year's graduating class at the College and was a great worker in the Y. W. C. A. and is a general favorite among her friends. The groom is superintendent of the Waterworks Irrigating Company at Golden, Colo. During a heavy shower of rice by classmates and friends and with best wishes, Mr. and Mrs. Morrison left on the nine o'clock train Wednesday evening for their home in Golden, Colo.—*Nationalist*.

Promptly at half past eight o'clock Thursday evening, June 23, 1904, the piano struck up the music which introduced the beautiful ring ceremony by which Harriet A. Vandivert, '97, and Prof. B. L. Remick were united in marriage. Miss Jeanette Perry, '98, sang "Past and Future" in her well-known charming manner. Miss Alice Perry, '03, accompanied her, and at its conclusion played the wedding march of Lohengrin, which ushered in the bridal couple. Professor Brink performed the marriage ceremony, and later shared in the congratulations bestowed upon the participants in a flawless performance of the solemn rite. During the ceremony Miss Alice Perry played softly Schubert's "Serenade." After cordial greetings had been most sincerely tendered the young couple a dainty luncheon was served. The guests included Doctor Vandivert, Miss Vandivert, Mrs. Weida, Miss Howell, and others from out of town, and the more intimate friends of the bride and groom in town. Mrs. Vandivert's beautiful new home, profusely decorated with plants and flowers, was crowded with the happy company, all of whom unite in expecting much happiness for Mr. and Mrs. Remick. The latter will spend the summer in St. Louis and the East, and after September 1 will be at home in the Weida residence, on Fremont street.